Quaternary Chronicles
Happenings in the Sub-continent
Vol.8 No.2 August 2026

FROM THE AOQR DESK

Dear Quaternary enthusiasts,

It gives me immense pleasure to connect with the Quaternary science community through this issue (Volume 8 No, 2) of Quaternary Chronicle published by AOQR. The rapid advances across Quaternary and allied disciplines continue to demonstrate the importance of interdisciplinary approaches for understanding Earth's past and its relevance to present and future environmental challenges.

As Treasurer of AOQR, I have seen the increase in the number of members, mostly early-career researchers, and the strengthening of collaborative networks across the region. AOQR remains committed to promoting scientific exchange, capacity building, and national cooperation in Quaternary science. The year has been particularly significant as preparations for the XXII INQUA Congress 2027, to be hosted in India, continue to gain momentum. As Convener of the Science Program Committee, I have had the opportunity to work with an enthusiastic team of researchers from diverse disciplines to develop a comprehensive and forward-looking scientific program. The response from the global community has been highly encouraging, reflecting the increasing relevance of Quaternary research in addressing issues such as climate variability, water resources, ecosystem change, and human-environment interactions.

AOQR, as one of the host partners for the XXII INQUA Congress 2027, is grateful to the national and international scientific communities for their active participation and valuable contributions in shaping the Congress program. As part of the pre-INQUA activities, we have interacted with previous INQUA Roma (2023) organizers in various episodes of the INQUA India 2027 podcast series, along with contributions from Indian researchers. The current podcast season also begins to unveil the ideas and thoughts of the National Co-ordination Committee members of the XXII INQUA Congress 2027, India. I urge all to look forward to the upcoming episodes of the podcast series.

This year has been very fruitful so far for young Quaternary researchers, as many Ph.D.s have been awarded to Quaternary scholars whose contributions are further mentioned. Many of them have been awarded and recognized by international committees and conference organizers for presenting their research across the globe. I hope we have many more such sincere contributions to the Quaternary Sciences from many more early-career researchers.

I invite researchers, students, and professionals to remain actively engaged with AOQR initiatives and the forthcoming INQUA Congress. Your contributions are essential for advancing Quaternary science and fostering meaningful scientific dialogue across regions and generations. I wish all readers an informative and inspiring reading experience with this issue of Quaternary Chronicle.

- Dr. Santosh K. Shah, *Treasurer, AOQR*
Scientist F, Birbal Sahni Institute of Palaeosciences, Lucknow
Convener, Science Program Committee, XXII INQUA Congress 2027

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AOQR MEMBERSHIP CALL

Researchers of Quaternary Science of Indian sub-continent are welcome to submit your application. Be a part of a multidisciplinary team of researchers, and practitioners of Quaternary Science and represent Indian Quaternary Science at an international level. Members can get priorities at our annual e-conferences, publish in the edited books/ journal volumes by the members of the AOQR, access to webinars, e-conferences and specialized thematic workshops etc.

Write to us at ***aoqr2019@gmail.com*** *for membership application form.*

The membership of the AOQR is open to all individual of academia and industry subject to verification.

Welcome!

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EDITORIAL TEAM

Pre-Activities of INDIA INQUA 2027

INQUA India Podcast: *This quarter, too, our RJ Veera Singh interviewed some legendary Quaternary scientists. Please listen to our podcast on Spotify. The Podcast series, Seasons 5 and 6, aims to create a platform to introduce the vision of researchers across the globe and to talk to them about the upcoming INQUA 2027 in Lucknow, India, and advances in Quaternary Sciences. The list of podcasts released is below. Do listen to them if not yet.*

Season 5 (2026)

Episode 5: *In Conversation with: Illaria Mazzini - April 16, 2026* ***Illaria Mazzini &Veraa Singh***

Episode 6: *In Conversation with: Allessandro Maria Michetti - April 20, 2026* ***Allessandro Maria Michetti & Veraa Singh***

Episode 7: *In Conversation with: Francesco Latino Chiocci - April 30, 2026.* ***Francesco Latino Chiocci & Veraa Singh***

Season 5 (2026)

Episode 1: *Decoding the Quaternary through Geochemistry - May 15, 2026* ***Dr. Anupam Sharma & Veraa Singh***

Episode 2: *In Conversation with: Dr. M Ravichandran, Secretary, MoES (Govt. of India) - May 29, 2026.* ***Dr. M Ravichandran, Shivangi Tiwari & Veraa Singh***

Episode 3: *Luminescence a time stamp - June 15, 2026* ***Dr. P. Morthekai & Veraa Singh***

Episode 4: *Oceanography: Insight through Foraminifera - June 28, 2026* ***Dr. Pawan Govil, Dr. Abhijit Mazumdar & Veraa Singh***

Episode 5: *In Conversation with: Dr. Shailesh Nayak, Former Secretary, MoES, Govt. of India - July 15, 2026.* ***Dr. Shailesh Nayak, Ramya Bala Prabhakar & Veraa Singh***

Episode 6: *In Conversation with: Prof. M. G. Thakkar - July 28, 2026.* ***Prof. M. G. Thakkar & Veraa Singh***

XXII INQUA 2027
28 January to 3 February, 2027
Lucknow, India

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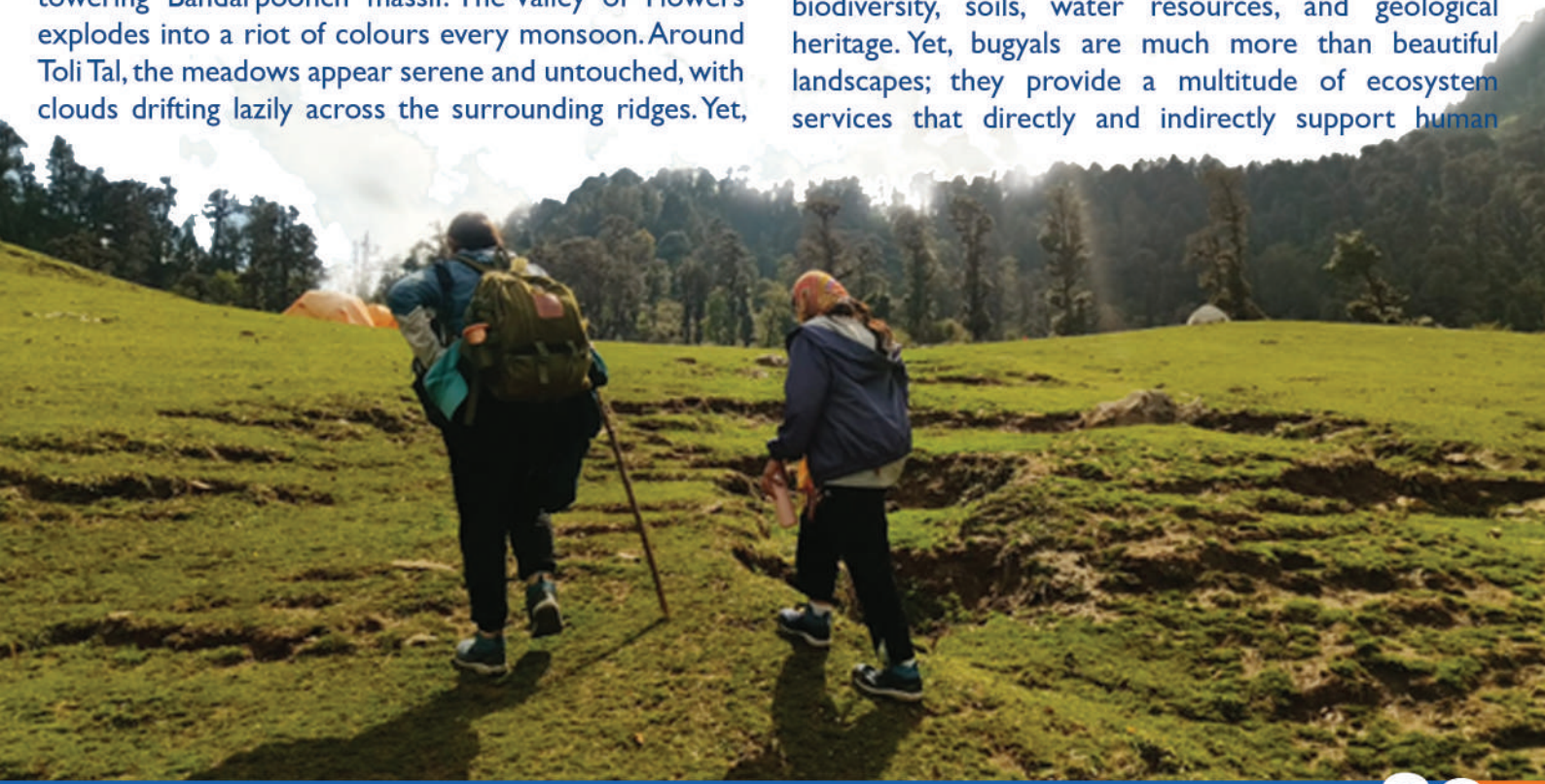
Sneak Peek

Bugyals: Where the Himalaya Breathes

Dr. Shravi Agarwal, Women Scientist,
WISE PDF, BSIP, Lucknow.

I still remember my first glimpse of a bugyal. After hours of climbing through dense forests of Oak and Rhododendron, the trail suddenly opened into an expansive green landscape. The trees disappeared, and before me lay a rolling meadow stretching towards snow-clad peaks. These are the Himalayan alpine meadows, locally known as Bugyals in Uttarakhand and Himachal Pradesh, and Margs in Kashmir. At approximately 3,000 and 4,500 metres above sea level, these meadows occupy the narrow ecological zone between the tree line and the permanent snow line. Here, the wind carried the fragrance of alpine herbs, and tiny wildflowers painted the grass in shades of yellow, purple, and blue. Standing there, I felt as though I had stepped into another world.

Over the years, I have had the privilege of walking through some of the most beautiful alpine meadows of Uttarakhand, viz., Chopta -Tungnath, Dayara Bugyal, the Valley of Flowers, and the meadows around Toli Tal and Panaar Bugyal. Each bugyal has its own personality. Dayara unfolds like an endless green ocean beneath the towering Bandarpoonch massif. The Valley of Flowers explodes into a riot of colours every monsoon. Around Toli Tal, the meadows appear serene and untouched, with clouds drifting lazily across the surrounding ridges. Yet, despite their beauty, all these landscapes share a common story: one of ecological significance, geological history, and increasing vulnerability. From a quaternary perspective, I found these meadows fascinating. They are fragile alpine ecosystems shaped by Late Quaternary glacial and periglacial processes. Their soils, geomorphology, and hydrology bear the signatures of former glaciers and permafrost activity. The retreat of ice over thousands of years created conditions that allowed these herbaceous communities to flourish, making bugyals living archives of past environmental change. During summer, these landscapes transform into vibrant mosaics of grasses, sedges, and flowering herbs, creating one of the richest biodiversity hotspots of the Himalayan region. Their isolation and harsh environmental conditions have encouraged the evolution of endemic and rare species uniquely adapted to life at high altitudes. Historically, the remoteness of these regions limited human exploitation, thereby preserving their biodiversity, soils, water resources, and geological heritage. Yet, bugyals are much more than beautiful landscapes; they provide a multitude of ecosystem services that directly and indirectly support human



well-being. They act as natural sponges, capturing snowfall and rainfall and gradually releasing water to downstream rivers and communities. Their soils store significant amounts of organic carbon, contributing to regional carbon sequestration and climate regulation. They support pollinators, provide summer grazing grounds for pastoral communities, and sustain livelihoods through eco-tourism and traditional transhumance.

However, each time I return to these mountains, I notice subtle but worrying changes. Snow seems to linger for shorter periods; slopes that once remained stable now show signs of erosion. In some places, shrubs are slowly advancing into open grasslands. The Himalaya is warming faster than many other mountain systems, and the bugyals are responding to these changes. Rising temperatures have led to declining snowfall and accelerated glacier retreat. These changes are altering soil moisture conditions, modifying vegetation patterns, and disturbing the delicate ecological balance of alpine landscapes. In many regions, warming has facilitated the upward migration of shrubs and trees, gradually transforming open meadows and threatening species adapted to cold alpine environments.

Another growing concern is the increasing instability of these high-altitude landscapes. During my last visit to Dayara bugyal in Uttarakhand, I observed areas affected by severe erosion and slope failures. Landslides in alpine regions have become increasingly common in recent years. The decline in snow cover and glacier retreat has reduced the stabilising influence of perennial ice and altered hydrological pathways, making slopes more susceptible to mass movements. Extreme rainfall events, now occurring more frequently and with greater intensity, further aggravate this instability. Such disturbances not only destroy meadow habitats but also disrupt water resources and pose risks to downstream communities.

The future of the Himalayan bugyals, therefore, demands urgent attention. These meadows are repositories of biodiversity, regulators of mountain hydrology, significant carbon sinks, and invaluable archives of Quaternary environmental change. Long-term ecological monitoring, restoration of degraded landscapes, sustainable grazing practices, and the integration of traditional ecological knowledge with modern scientific research are essential for their conservation. As I think back to those moments during my visits, I realise that the bugyals are far more than picturesque destinations for trekkers. They are living laboratories of evolution and sentinels of climate change. Their rolling green expanses tell a story that began with glaciers thousands of years ago and continues to unfold today under a warming climate. The next time we stand in a bugyal and watch the clouds drift across the Himalayan peaks, we should remember that these meadows are not timeless. They are changing, and their future depends on how well we understand, value, and protect these fragile ecosystems for future generations.

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The South Steps Up: An Interaction with Prof. Pradeep Srivastava

Department of Earth Sciences, IIT Roorkee; Vice President of INQUA; and President of XXII INQUA 2027 India.

Interviewer: Dr Ekta Singh
Postdoc Fellow, IIT Roorkee

Ekta – What makes the Himalaya a globally significant region for geological research?

Prof. – Firstly, the Himalaya is the source region for at least five to six major river systems: Ganga, Brahmaputra, Indus, Yangtze, Irrawaddy, and Amu Darya. These river basins collectively support nearly one-third of the world's population. Therefore, whatever happens in the Himalayas has direct implications for a significant portion of humanity, whether through climate change, hydrological extremes, or the dynamics of floodplains shaped by these rivers. This, in itself, makes the Himalaya critically important.

Secondly, all these river systems ultimately drain into major oceanic bodies, such as the North China Sea, the Bay of Bengal, and the Arabian Sea, within the broader Indian Ocean system. The sediment load and geochemical characteristics of these oceans are strongly influenced by processes occurring in the Himalayas, including their interaction with climate variability and tectonic activity. In that sense, the Himalaya and the oceans form a coupled system.

Once we recognise this coupling, it becomes evident that the entire Himalayan biome, the adjoining alluvial plains, and the connected oceanic systems are deeply interlinked. Moreover, this is not a static system; it is highly dynamic and continues to evolve. As a result, the Himalaya offers insights into virtually every dimension of Earth science. It is an active system that allows us to observe and understand geological processes in real time.

Ekta – How have scientific techniques transformed Quaternary research in the Himalayas?

Prof. – Technology has helped us understand not only the recent geological past of the landscape but also its present-day dynamics. Take remote sensing, for example. Over the last 30 years or so, it has transformed the way we understand landscapes. Earlier, remote sensing essentially provided static images of landscapes. However, technologies such as LiDAR and other advanced tools now provide dynamic data instead of static images. Similarly, dating techniques have evolved

tremendously. Today, we can date materials ranging from one location to another, and reconstruct the evolution of river systems and landscapes with much greater precision. When you work only through field geology, without a laboratory, you are largely operating within one dimension of interpretation based on direct observations and experience. However, the introduction of laboratory data adds a multidimensional aspect to geology, as it is fundamentally based on physics and mathematics. So now you are integrating geology with other science subjects.

That is also where the real challenges begin, because natural processes are highly nonlinear and often do not neatly converge into a single explanation. This forces researchers to think more deeply and develop newer scientific frameworks. Technology has not only provided finer details but has also fundamentally improved our understanding of surface processes and the forcing mechanisms behind them. Today, with improved scientific tools and analytical precision, the focus has shifted from correlation to variability. Now we are more interested in understanding why surface processes vary from one region to another and in comprehending the differences and complexities within those systems.

Ekta – What advice would you give to students aspiring to work in quaternary geology in the Himalaya?

Prof. – Quaternary is only a time slice. Before anything else, you need to understand the geology of the Himalaya itself. Regardless of what you are studying, be it sediments, river systems, lake systems, or others, you need to grasp the fundamental geology of the Himalayas and then understand how the Himalayan orography interacts with rainfall patterns and climate systems. One must understand the area's potential and how it responds to larger climatic systems and global climatic cycles. So, first understand the larger picture and existing literature, and only then narrow down to a specific research problem.

Ekta – What message would you like to give for the upcoming INQUA Congress?

Prof. – Europeans and Americans largely dominated Quaternary Geology and INQUA, and what we broadly call the Global North. That is how their academic

The South Steps Up: An Interaction with Prof. Pradeep Srivastava

timelines, frameworks, and priorities were historically shaped. This is the first time we've brought INQUA to India, and we changed that larger perspective, showing that the Global South has a lot to offer. One aspect is the varied geology and Quaternary landscapes here. Another important thing is that this is perhaps one of the few regions where you can clearly observe the human impact on landscapes at a massive scale.

Coming to India is the result of long-term efforts. It is not a single moment or decision that made this journey happen. It is the outcome of nearly 40–50 years of continuous work. Scientists have consistently contributed to Quaternary research, have associated themselves with INQUA, and have steadily increased India's visibility in global Quaternary science through publications, collaborations, and other scientific contributions. That gradual effort helped place India prominently on the global scientific map.

Now we have the responsibility to live up to the commitment we made to the global community in 2023: that India will present one of the best possible representations of geosciences and Quaternary research to the world. And not only science, but also India's culture, cuisines, societal diversity, and intellectual traditions. We want the global community to recognise that the Global South is also a very important contributor to the evolution of global science and knowledge systems.

At the same time, we must remain conscious that a tremendous amount of effort has gone into achieving this opportunity. The people currently visible at the forefront of the INQUA organisation are not the only contributors. This is also the effort of earlier generations over the past 5 decades, many of whom may not be visible today but worked tirelessly to build this foundation. Therefore, we also carry the responsibility of honouring the commitments and contributions of those past generations.

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Ancient Teeth, Atomic Diaries:
The Silent Stories Written in Enamel

Snigdha Konar, BSIP, Lucknow
(PhD Supervisor: Dr. Niraj Rai)

In a calm laboratory, a speck of tooth, less than the size of a grain of salt, is vaporised by a laser beam. The vapour passes into a mass spectrometer, and after several seconds, a string of numbers appears on the computer screen. To the neophyte, it's simply data. To a bioarchaeologist, it's a sound from the dead, the child's diet, the location of his birth, the season he fell ill, all for millennia preserved in the hardest tissue of the human body. This is the strength of stable isotope analysis of dental enamel, and it is changing the way we hear the deep past.

Teeth are amazing time capsules. Enamel is laid down in infancy and childhood as a tightly crystallized matrix of calcium phosphate that is not remodelled after it's formed. It outlasts bone in soils, cremation preys, and other decaying tissues. As it forms, it incorporates atoms from the food and drinks a child consumes, leaving behind unique geologic and dietary "fingerprints" in the form of the various stable isotopes.

The chemistry is beautifully straightforward. There are two stable isotopes of carbon, carbon-12 and rarer carbon-13. Crops with different photosynthetic pathways, such as temperate cereals versus tropical grasses like maize and sorghum, produce distinct carbon isotope signatures. The ratio is recorded in a molars enamel and shows if a person was fed wheat and barley or millet and corn. The spread of maize agriculture across the Americas can be tracked not just in charred cobs but in the very mouths of the farmers themselves. Strontium isotopes tell even more intimate migration stories. They pass from soil and water through the food chain unaltered, reflecting local bedrock geology. The strontium in a milk tooth or a wisdom tooth acts as a childhood postcode. A skeleton with an out-of-place in the local soil, a migration story begins. Thus, the Amesbury Archer, the wealthy Bronze Age man buried near Stonehenge, was shown to have spent his early years in the Alps; the 'Ivory Bangle Lady' of Roman York was traced to North Africa; and countless Viking raiders in Britain were revealed as locals moving under a new cultural banner. There are additional layers of oxygen isotopes that vary with rainfall, temperature, and altitude. Now scientists can micro-sample enamel growth layers, like reading the rings of a tree, to detect short-term seasonal changes, such as a shepherd following flocks to summer pastures or a woman moving away from her birthplace to marry. These are no longer population statistics but the lives of individuals.

Why enamel?
The bone, excellent for other isotope studies, turns over during life, yielding a mixed (adult) signal. Enamel is the only thing that can maintain the pristine conditions of early life. It can provide answers to questions that no other archaeological artefacts could: Was a child weaned at an early age due to environmental stressors? Was there an abrupt change in diet, indicating famine or enslavement? The use of isotopes in enamel is now helping to identify the origins in Africa of a person in the transatlantic slave trade, giving some measure of identity back to those who have had it taken from them. Paired with ancient DNA and proteomics further enhances resolution; for instance, a recently sequenced Bronze Age teenage girl from Denmark had isotopes indicating she originated far beyond the region, and her gut microbes revealed a shift from mother's milk to gruel. The best thing about stable isotope work is that it is personal. It turns anonymous bones into individuals. It reminds us that history is not just an abstraction of kingdoms and trade routes, but a mosaic of human journeys, each one inscribed invisibly in the teeth beneath our smiles.

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NEW FINDINGS

Palaeoclimate Perspectives on the Development and Transformation of the Harappan Civilization

Anjali Trivedi & Anupam Nag, BSIP, Lucknow.

Harappan Civilization, or Indus Valley Civilization (IVC), was one of the earliest urban societies of the Bronze Age in South Asia. It developed along the Indus River and its tributaries, occupying a vast region that stretched from present-day northeastern Afghanistan across Pakistan to northwestern India. First identified through excavations at Harappa by Daya Ram Sahni in 1921, the civilization was centered on the Indus River and its major tributaries, including the Jhelum, Chenab, Ravi, and Sutlej, and occupied a large part of the northern Indian subcontinent. Spread across diverse environmental settings, it is renowned for its extensive settlements, advanced urban planning, and significant contribution to the cultural development of ancient South Asia.

Approximately 1,500 Harappan sites have been identified across a wide range of environmental settings, including the arid Thar Desert, the semi-arid plains of Haryana and Rajasthan, the floodplains of the Indus and Ghaggar-Hakra river systems, the coastal regions of Gujarat, and the Himalayan foothills. These settlements varied in size and function, ranging from small agricultural villages to large, well-planned urban centres.

The Indian Summer Monsoon (ISM) is a dominant climatic system of the Indian subcontinent, accounting for 75–90% of annual rainfall, primarily between June and September. The Holocene (~11,700 years to present) witnessed major climatic and cultural developments, including the rise and transformation of human societies. The Mid–Late Holocene (~8200 cal yr BP to present) is of particular interest due to significant climate fluctuations that coincided with important societal changes. Therefore, this study examines climate variability and human– environment interactions during this period.

The Harappan Civilization is generally divided into three phases: Early Harappan (5200–4500 cal yr BP), Mature Harappan (4500–3900 cal yr BP), and Late Harappan (3900–3000 cal yr BP). The Early Harappan phase marked the establishment of settlements, while the Mature Harappan phase represented the peak of urban development and socio-economic complexity. After ~4000 cal yr BP, urban centres gradually declined, leading to the Late Harappan phase. Agricultural practices also changed through time, with winter crops dominating the Early Harappan period, mixed winter and summer cropping during the Mature phase, and drought-tolerant millets becoming increasingly important during the Late Harappan period. This review synthesizes evidence from seventeen well-dated archaeological sites with high-resolution palynological and archaeobotanical records to assess regional climate variability and its influence on agricultural systems and settlement dynamics across the Harappan cultural sequence (Figure 1).

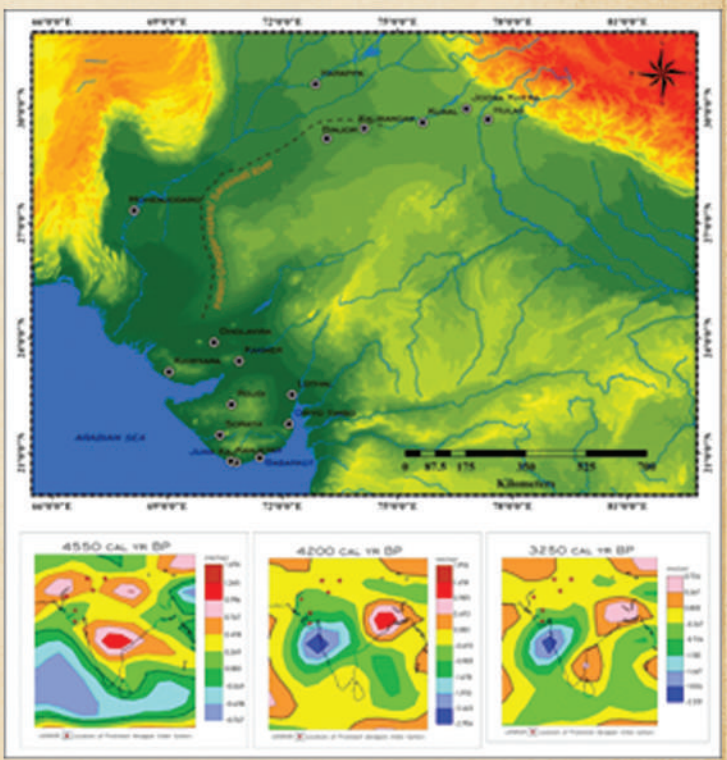
To examine climatic changes during the Early, Mature, and Late Harappan phases, monsoonal precipitation (JJAS: June–September) derived from Earth System Palaeoclimate Simulation (ESPS) models was compared with pollen and other palaeoclimate proxy records. The Early Harappan phase was characterized by strong monsoon conditions and favourable agricultural

productivity, corresponding to the Holocene Climate Optimum (HCO). ESPS simulations (~4550 cal yr BP) indicate enhanced precipitation, supporting a strengthened ISM during this period (Figure 2).

In contrast, the Mature Harappan phase experienced increasing aridity, reflected in the growing importance of drought-tolerant crops. This trend coincides with the 4.2 ka climatic event, with both proxy evidence and ESPS simulations (~4200 cal yr BP) indicating weakened monsoon activity and reduced precipitation (Figure 3). During the Late Harappan phase, the predominance of drought-resistant crops suggests continued adaptation to drier conditions, a pattern further supported by proxy records and ESPS simulations (~3250 cal yr BP) showing persistently low precipitation and a weakened ISM (Figure 4).

The Harappan Civilization adapted to changing climatic conditions by shifting its agricultural practices and settlement patterns. However, increasing aridity, particularly during the 4.2 ka event, likely contributed to the decline and dispersal of settlements. Overall, the Harappan record highlights the strong influence of climate on the development and transformation of early urban societies in South Asia.

Location of key Harappan archaeological sites investigated in this study and a synthesis of palaeoclimatic evidence illustrating Indian Summer Monsoon (ISM) variability during the Early, Mature, and Late Harappan phases. The figure also includes Earth System Palaeoclimate Simulation (ESPS) model out puts for ~4550, ~4200, and ~3250 cal yr BP, representing precipitation patterns associated with the Early, Mature, and Late Harappan periods, respectively.



Reference: Trivedi, A., Nag, A. (2026). Climatic Shifts and Societal Responses: Agriculture and Community Adaptation in the Harappan Civilization in the Indian Subcontinent. RAVIKĪRTI Illuminating the Great Traditions of Harappan Culture, Agam Kala Prakashan, 137-139. ISBN: 978-93-92556-80-7

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PhD Awarded

Dr. Deeksha
Department of Geology, University of Lucknow & Birbal Sahni Institute of Palaeosciences, Lucknow.

Thesis Title: Hydroclimate Variability Based on Instrumental and Proxy Records of Chhattisgarh, Central India

Supervisor: Prof Munendra Singh, C.A.S. Department of Geology, University of Lucknow, Lucknow.

Co-Supervisor: Dr. Santosh Kumar Shah, Scientist F, Birbal Sahni Institute of Palaeosciences, Lucknow.

Climate change is intensifying hydroclimatic extremes, including floods, droughts, and heatwaves, especially in tropical regions like Chhattisgarh, central India. The region's dependence on agriculture, water, and forest resources makes it particularly vulnerable. This study investigated hydroclimatic variability using instrumental rainfall and streamflow data, as well as proxy data, including teak tree-ring chronologies and oxygen-isotope records.

Instrumental data analysis was performed using Principal Component Analysis (PCA) and trend and magnitude tests (Mann-Kendall and Sen's slope) to assess variability. Results indicate no significant trend in monsoon rainfall, while streamflow shows a positive trend at most stations, suggesting the influence of temperature changes and land-use dynamics. Rainfall and streamflow were further correlated with multiple climate indices, revealing that monsoon rainfall is influenced by ENSO, PDO, AMO, and Indian Ocean SSTs, with stronger correlations at decadal timescales. Streamflow correlations are weaker due to local hydrological and anthropogenic factors.

Proxy-based analyses using teak (Tectona grandis) tree-ring width, reconstructed hydroclimatic variability beyond the instrumental period. Using tree-ring width and tree-ring width oxygen isotope records, soil moisture, and Standard Precipitation Evapotranspiration Index (SPEI-1) were reconstructed. Both captured historical droughts, soil moisture fluctuations, and monsoon variability, showing significant correspondence with global climate oscillations such as ENSO. These reconstructions support a long-term understanding of hydroclimate patterns, which is essential for water resource management, climate modeling, and sustainable agriculture.

Future work should extend tree-ring chronologies, integrate multiple tree-ring parameters, expand spatial coverage, and couple instrumental and proxy data with hydrological modeling (e.g., SWAT) to enhance predictions of river discharge and regional climate dynamics. This approach will provide robust insights into long-term hydroclimatic variability and its societal and environmental implications in central India.

Dr. Ammoose K Jayan
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Thesis Title: Planktic foraminifera and their geochemistry in north-eastern Indian Ocean sediments: Implications for Holocene and Last Glacial Indian Summer Monsoon variability

Planktic foraminifers are single-celled marine organisms that secrete calcium carbonate shells

during their life cycle. They are ubiquitous in tropical-subtropical oceans and are also found in polar oceans. They are excellent proxies for reconstructing past climates and oceanographic conditions because they are abundant and well-preserved in marine sediments. Species abundances and their geochemistry reflect local and regional changes in surface, thermocline, and deep-water conditions. Over the last few decades, several studies have focused on paleoceanographic and paleoclimatic reconstructions using planktic foraminifera from sediments of the northeastern Indian Ocean. This study provides a comprehensive late Quaternary to Holocene reconstruction of surface hydrography and monsoon variability across the northeastern Indian Ocean, encompassing the Andaman Sea, the Bay of Bengal (BoB), and the Gulf of Mannar (GoM), using core-top and downcore samples.

The study represents the first late Quaternary record of Globigerinoides ruber morphotypes (sensu stricto and sensu lato) from the Andaman Sea. Contrary to earlier reports suggesting the regional extinction of G. ruber (pink) in the Indo-Pacific Oceans around 120 kyr BP, this study documents its presence between ~30 and 8 kyr BP in the eastern BoB core MGS30. Notably, the G. ruber (pink) specimens in the analyzed core samples do not exhibit a distinct pink hue; rather, they have an orangish-pink tint. We observed a gradual fading of coloration across the chambers, with most specimens showing pink coloration only in their initially formed chambers.

The isotopic analysis (Individual Foraminiferal Analysis; IFA) of modern G. ruber morphotypes from the northeastern Indian Ocean core-tops reveals negligible δ18O and δ13C offsets between s.s. and s.l. forms, implying similar calcification depths and seasonal preferences. The findings conclude that neither vital effects nor environmental preferences are important drivers of s.s. and s.l. geochemistry. The mean δ18O values of both s.s. and s.l. morphs exhibit more negative values in the eastern BoB, followed by the northwestern BoB and GoM samples. The spatial heterogeneity in the δ18O values of G. ruber may be attributed to freshwater runoff into the northern bay and resulting salinity changes in the upper water column, as well as minor temperature differences. We suggest avoiding biases in the use of non-selective mixtures of G. ruber morphotypes for paleoceanographic reconstructions in the Indian Ocean, at least for Holocene samples, or for periods with similar biogeochemical and oceanographic conditions that allow G. ruber morphs to calcify within the same ambient waters.

Supervisor: Dr. Sijin Kumar A.V., Professor, Department of Geology, Central University of Kerala, India

Co-supervisor: Dr. Kaustubh Thirumalai, Associate Professor, Department of Geosciences, University of Arizona, USA

Dr. Nagendra Prasad
Post Doctoral Fellow, Ashoka University, Sonipat, Haryana, India

Thesis Title: Reconstruction of Holocene vegetation dynamics and climate change from the core monsoon zone of India

Supervisor: Dr. Md. Firoze Quamar, Scientist-E, Birbal Sahni Institute of Palaeosciences, Lucknow, India; Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India.

The Core Monsoon Zone (CMZ) of the Indian subcontinent, extending from 18°–28°N and 65°–88°E, is the region where the Indian Summer Monsoon (ISM) is most pronounced. The ISM is a key component of the Asian Summer Monsoon System, which mediates interhemispheric heat and moisture transport between the Asian continent and the Indian Ocean.

My study reconstructs Holocene vegetation dynamics, climate change, ISM variability, and anthropogenic activities using a multiproxy approach integrating palynology, stable isotopes ($\delta^{13}C_{TOC}$ and $\delta^{15}N$), grain-size analysis, and environmental magnetism from three lacustrine archives, Buka Lake (BL), Tuman Lake (TL), and Raja–Rani Lake (RRL) located in the Korba District, Chhattisgarh, India. The integrated proxy

records demonstrate a strong coupling between ISM variability and lacustrine– catchment processes throughout the Mid to Late Holocene. Vegetation dynamics within the CMZ were primarily governed by moisture availability, with transitions from savannah and open forest under weak monsoon conditions, to wooded savannah during phases of moderate ISM strengthening, and ultimately to mixed and dense tropical deciduous forests during periods of intensified monsoon rainfall. Cooler, drier climatic intervals consistently favored open vegetation, whereas warmer, more humid conditions promoted forest expansion.

The reconstructed ISM histories from BL (last ~2.5 ka), RRL (last ~3.6 ka), and TL (last ~8.2 ka) reveal coherent centennial- to millennial-scale variability that broadly corresponds with major regional and global climatic episodes, including the 8.2 ka event, the Holocene Climate Optimum, the Roman Warm Period, the Medieval Climate Anomaly, and the Current Warm Period. Evidence of anthropogenic activity, including agricultural expansion, is apparent from ca. 8.2 ka, with gradual intensification after ~2860 cal yr BP and a pronounced increase after ~220 cal yr BP.

Dr. Shashi Shekhar Shukla
Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi

Title: Palaeo-Geomorphic Features and the Environment: A Study of Sai-Ganga Interfluve, Uttar Pradesh, India

Supervisor: Prof. Padmini Pani, Centre for the Study of Regional Development, School of Social Sciences, Jawaharlal Nehru University, New Delhi

The Sai–Ganga Interfluve (SGI), situated within the Central Ganga Plain, preserves an extensive assemblage of palaeo-fluvial landforms that provide valuable insights into the Late Quaternary landscape evolution of the region. Despite the absence of a large active river across the interfluve today, the region contains numerous palaeochannels, oxbow lakes, crevasse splays and backswamps, indicating the former presence of a dynamic fluvial system. This study investigates the evolution of these palaeo-landforms and evaluates their influence on the present-day landscape and human activities.

A comprehensive geomorphological mapping was carried out using multi-temporal satellite imagery, including Landsat-5 and Google Earth datasets, supported by detailed visual image interpretation. More than 200 palaeo-oxbow lakes (~100 km²), numerous palaeochannels covering approximately 1,200 km² with a cumulative length of nearly 9,800 km, eight palaeo-crevasse splays, and 66 palaeo-backswamps (~180 km²) were identified. The mapped features were validated through DGPS surveys, DEM-derived topographic profiles, and lithological trench investigations, which reveal sand-rich fluvial deposits at depths of 2–3 m, confirming their fluvial origin.

Ten representative sites were investigated using sedimentology, geochronology, and geochemical analyses. Grain-size analysis, optically stimulated luminescence (OSL) dating, AMS radiocarbon dating, major oxide geochemistry, and trace and rare earth element (REE) analyses were used to reconstruct depositional history and sediment provenance. The results indicate that a major Himalayan-fed river traversed the SGI during the early to mid-Holocene. The OSL

ages suggest that the principal palaeochannel remained active until the early Holocene, while a palaeomeander of the Sai River records a broad, unconfined channel around the same time. These findings indicate a transition from a wide, avulsive fluvial system to the present confined and incised river network. Geochemical signatures further suggest a dominantly felsic sediment source, consistent with Himalayan provenance.

The study also demonstrates that these inherited palaeo-landforms continue to exert a strong influence on settlement patterns, groundwater recharge, flood susceptibility, waterlogging, and salt-affected soils. Although engineering interventions, drainage modification, and land reclamation have reduced some hazards and risks, recent anthropogenic alteration of palaeo-landforms has accelerated landscape degradation and threatens their ecological functions. The SGI therefore represents not only an exceptional archive of Late Quaternary fluvial evolution in the Ganga Plain but also a landscape where understanding geomorphic inheritance is essential for sustainable land-use planning and conservation.

Dr. Aparna Dwivedi

Ancient DNA Lab, Birbal Sahni Institute of Palaeosciences, Lucknow; Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India.

Thesis Title: Reconstructing Neolithic and Megalithic Population histories of South Asia using Ancient DNA and Stable Isotope Analysis.

Kashmir sits at the convergence of the Himalayas, the Northwestern plain, East Eurasia, and China, making it an ideal place to study human migrations. The unique Neolithic-Megalithic archaeological site of Burzahom in Kashmir demonstrates a transition from the Neolithic to the Megalithic and early historic periods, spanning around 4500 years of human habitation. The site revealed ten human skeletons in pit burials. This study attempts to answer questions that have lingered for five decades about the genetic identities and interactions of these individuals, using ancient DNA and stable isotope analyses to reconstruct the demographic history of the region. Petrous bone and teeth from the skeletal remains were processed for ancient DNA extraction and sequencing. Two high-coverage samples were processed with downstream analyses. Both individuals were identified genetically as males and dated (using Accelerator Mass Spectrometry) to around 1927 BCE and around 563 CE. The earliest individual from the site dated to 3926 BCE. The Neolithic individual was assigned to the deeply rooted mitochondrial haplogroup M, indicating strong continuity of the indigenous matrilineal lineage extending back to the Late Pleistocene. The Early Historic individual with haplogroup U2b2 demonstrated a deep association with the Rakhigarhi and SPGT populations. This suggests that the population was an endogenous community whose genetic structure was shaped by selective external interactions.

The autosomal analysis revealed that the Early historic population shows a minimal Steppe-related component, much less than in the Swat Valley Bronze Iron Age population (SPGT/Swat Primitive Grave Type), suggesting that Burzahom participated in very early genomic interaction networks that predated any large-scale demographic impact of Steppe_MLBA expansions. Thus, the Kashmir valley lies in a transitional zone that offers scope for a genomic and cultural corridor between South Asia and Inner Asia. The stable isotope analyses of Carbon and Nitrogen demonstrated a C3-dominant mixed diet, with minimal C4 and occasional animal protein. This is consistent with a stable agricultural subsistence at the site, with occasional hunting. The results of this study indicate that the Burzahom population is culturally and biologically connected rather than an isolated settlement in the Himalayan region. Carbon and nitrogen stable isotopic data from bone collagen reveal a terrestrial C3-based diet supplemented by occasional C4 input and small variable amounts of animal protein.

The predominance of a C3 plant-based diet is also in agreement with the archaeobotanical evidence for the cultivation of wheat and barley in the Kashmir valley. The moderate $\delta^{15}N$ values suggest a mixed subsistence economy that involved domestication and occasional hunting of herbivores. This mixed-diet subsistence was supported by tooth enamel carbon-isotopic data reflecting differential access to C3 and C4 plant resources. The oxygen stable isotope data from enamel demonstrated inter-individual variation in water intake, shaped by altitude and seasonality, rather than by long-distance migration. The constraints of poor preservation, along with the severe underrepresentation of South Asia and the complete absence of genome-wide Neolithic data from India, make this low-coverage data both important and rare direct genetic evidence that provides valuable temporal and geographical resolution. Thus, the study becomes crucial in addressing the gap in South Asian archaeogenetics.

Supervisor: Dr Niraj Rai, Scientist E, Ancient DNA Lab, BSIP Lucknow; Academy of Scientific and Innovative Research (AcSIR), Ghaziabad, India.

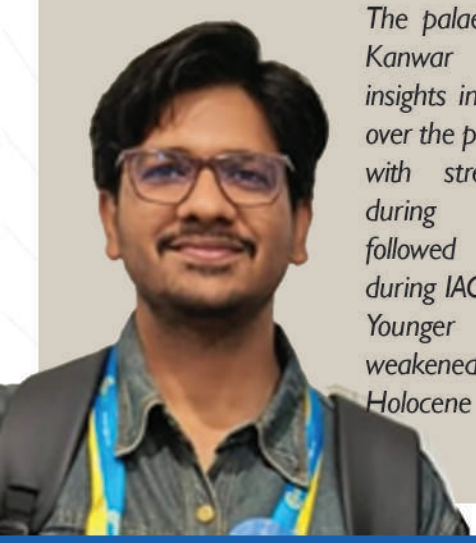
Dr. Arvind Tiwari
BSIP, Lucknow, Uttar Pradesh

Thesis Title – Variability of the Indian Summer Monsoon during the Late Quaternary in the Central Ganga Plain.

Supervisor: Dr. Binita Phartiyal, BSIP, Lucknow, Uttar Pradesh, & AcSIR, Ghaziabad, India.

The climate of the Indian subcontinent is governed by complex interactions between the atmosphere, ocean, land, and cryosphere, with the Indian Summer Monsoon (ISM) playing a key role in sustaining water resources, agriculture, and livelihoods. However, its long-term variability remains poorly understood due to limited instrumental records. In the face of increasing climate extremes and anthropogenic warming, reconstructing past monsoon behaviour has become essential for placing recent changes in a longer-term perspective and improving future projections.

This study presents a multi-proxy reconstruction of ISM variability from the Central Ganga Plain (CGP), a climatically sensitive and densely populated region. Lacustrine records from Kanwar Wetland, Karela Lake, and Lahuradewa Lake were analysed to reconstruct Late Quaternary hydroclimatic changes using a multi-proxy approach, including mineral magnetic properties, sedimentological characteristics, stable carbon isotope (δ13C values), and C–N elemental data, supported by AMS 14C chronology, providing insights into depositional processes, monsoon variability, and vegetation dynamics.



The palaeoclimatic record from Kanwar Wetland provides insights into monsoon variability over the past ~15,000 cal yrs BP, with strengthened conditions during the Bølling–Allerød, followed by abrupt declines during IACP A1, IACP A2, and the Younger Dryas, and several weakened phases through the Holocene at ~10,600, 8,200, 6,000, 4,200, 2,800, and 1,400–600 cal yrs BP. Superimposed on these trends are distinct short-term cycles, likely linked to solar forcing, while a ~1492-year cycle suggests combined forcing by external (solar) and internal (AMOC) processes during the Holocene. The ~6,350-year record from Karela Lake indicates shifts in sediment influx driven by rainfall-induced weathering and catchment erosion, identifying multiple wet and dry phases during the mid- to late Holocene. Notably, periods of reduced monsoon intensity recorded in both the Kanwar and Karela records also correspond with decreased upwelling in the Arabian Sea, indicating a broader coupling between regional monsoon dynamics and oceanic processes.

Meanwhile, preliminary data from Lahuradewa Lake extend the monsoon reconstruction back to ~29,000 years, capturing long-term transitions from glacial aridity to Holocene variability, with increasing human influence evident in the late Holocene. Vegetation changes inferred from δ13C values in the Kanwar Wetland sediment record further demonstrate the ecological sensitivity to monsoon variability, with a transition from C3- and mixed C3-C4-dominated vegetation in the terminal Pleistocene–early Holocene to C4-dominated landscapes during the late Holocene, particularly under weakened monsoon conditions.

Together, these records demonstrate that the Central Ganga Plain preserves a coherent and regionally consistent signal of past monsoon variability, closely linked to global climatic drivers. This study not only fills a critical geographical gap in Indian palaeoclimate research but also underscores the value of multi-proxy lake sediment archives in decoding monsoon dynamics.

Such long-term perspectives are vital for understanding the monsoon system's sensitivity and anticipating future changes in one of the world's most climate-dependent regions.

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AOQR-ECN's

QUATERN STORIES

The Early Career Researcher (ECR) Network of the Association of Quaternary Researchers (AOQR) successfully launched its webinar series, 'Quatern Stories, Bridging Research, Regions & Next Generation' in May 2026. The AOQR ECN is dedicated to amplifying the voices of early career researchers and ensuring their contributions are central to the scientific discourse. It also aims to bridge the gap between researchers at smaller, under-resourced institutions and their counterparts at larger research centres. This monthly webinar series represents the network's first major step towards achieving these goals. Each session is designed as a comfortable and collaborative platform that brings together early-career researchers and senior scientists. Current PhD students and other emerging members are invited to present their work, engage in discussion, and receive mentorship from established researchers, all within an environment that prioritises learning and constructive feedback over formality.

Prof. A.K. Singhvi

The inaugural session was held on Friday, 15 May 2026, featuring a lecture by the eminent scientist Prof. A.K. Singhvi on "Research Ethics and Future Challenges." The opening talk laid a vital ethical foundation for researchers, addressing scientific integrity, the boundaries of plagiarism and data misconduct, and the complexities of fair authorship. In keeping with the AOQR ECN's commitment to researcher well-being, the presentation also underscored the community's ethical responsibility to foster a positive research culture and uphold integrity in an era dominated by paper-mill practices and the relentless pressure to "publish or perish.

Dr. Sohan Kumar

Following the ethical framework established by the senior scientist in the inaugural session, the second webinar, on regional science, featured a lecture by early-career researcher Dr. Sohan Kumar on 21 June 2026. His talk, titled "Climate-Tectonic Interactions and Their Influence on Weathering-Erosion Coupling in the Garhwal Himalaya," offered a deep dive into the geomorphology of the Central Himalayas, demonstrating how active tectonic uplift and monsoonal precipitation intricately govern landscape evolution and geochemical weathering.

Dr. Binish M.B.

Continuing the QUATERN_STORIES webinar series, the third session featured Dr. Binish M.B., Project Scientist I, ESSO–National Centre for Polar and Ocean Research (NCPOR), Ministry of Earth Sciences, Goa, on 24 July 2026. His talk, "Life and Science on the Antarctic Frontier: Insights from Indian Expeditions," provided an engaging overview of Antarctic research, highlighting the scientific importance of Indian polar expeditions, climate studies, and the challenges of conducting research in extreme environments. The lecture offered valuable insights into polar science and inspired participants to explore emerging opportunities in Earth system and climate research.

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EGU General Assembly 2026: A Memorable Scientific Experience!

Dr. Arvind Tiwari *attended the European Geosciences Union (EGU) General Assembly 2026, held in Vienna, Austria, from 03–08 May 2026. The meeting brought together a large international community of Earth scientists across diverse disciplines, featuring approximately 22,000 presentations across 1,014 sessions. It provided a comprehensive overview of current developments in geosciences, open scientific communication, and emerging digital research infrastructures, with more than 50% of contributions from Early Career Scientists (ECS).*

During the conference, he presented his research titled "Coupled Climate–Vegetation Dynamics over the Last 15 ka in the Central Ganga Plain: A Multi-Proxy Record from Kanwar Wetland, India." The study focuses on reconstructing Late Quaternary variability in the Indian Summer Monsoon and associated vegetation changes using a multi-proxy approach.

This provided a valuable platform to engage with experts in monsoon dynamics, palaeoclimate reconstruction, proxy system interpretation, as well as emerging approaches such as climate modeling and AI-driven data analysis. Interactions with researchers from diverse backgrounds not only offered expert insights but also encouraged broader, interdisciplinary discussions, fostering fresh perspectives related to today's data-driven scientific environment.

62nd Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2026) held from 28 June – 03 July 2026 at Xishuangbanna, China, hosted by Xishuangbanna Tropical Botanical Garden (XTBG) and Chinese Academy of Sciences (CAS).

Jereem Thampan, *a PhD Graduate student from DST – Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow, under the supervision of Dr Jyoti Srivastava (Scientist E, DST - BSIP Lucknow) and Prof Mahesh Sankaran (Professor, TIFR – NCBS Bangalore), attended the 62nd Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2026) held from 28 June – 03 July 2026 at Xishuangbanna, China, hosted by Xishuangbanna Tropical Botanical Garden (XTBG) and Chinese Academy of Sciences (CAS). The conference was an annual gathering of ecologists and biodiversity conservationists from around the world for 6 days. At the conference, Jereem Thampan chaired a symposium titled, "How are climate change and human disturbances altering the floral distribution in tropical dryland regions?" and also presented a talk titled, "Modelling the Potential Vegetation Changes to Past and Future Climate Scenarios in Indian Drylands".*

The talk featured vegetation changes in Northwestern Indian drylands from the Last Glacial Maximum (~22,000 years BP) to AD 2100, using fossil pollen data, current distribution records, and Species Distribution Models (SDMs) of selected arid and semi-arid plants. His results showed that past vegetation was dominated by semi-arid plants, which subsequently decreased due to environmental changes in the region. His results on future predictions suggest greening of the region due to the increased shift of semi-arid plants to this region, which threatens the endemic arid vegetation. The results suggest the need for species-specific conservation measures and the establishment of additional protected areas to conserve the region's arid ecosystem. The conference examined the impacts of climate change and human disturbances on various tropical ecosystems and discussed methods to conserve tropical biodiversity. The conference provided every attendee with insights into the grave dangers facing tropical ecosystems and their importance to conservation.

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Honours/ Awards/ Recognition/ Young Talent

Dr. Sayoni Mondal, *CSIR Research Associate at the Department of Earth Sciences, IISER Kolkata, was awarded the ANRF International Travel Grant (ITS) to attend the 11th IAG International Conference on Geomorphology, held at Te Pae Convention Centre, Christchurch, New Zealand, from 02 – 06 February, 2026. Her oral presentation at the conference was on "Late Holocene channel adjustments from meandering to low-sinuous along the lower Subarnarekha River in Eastern India: implications of paleoclimatic changes", which examined river channel metamorphosis and its responses to tectonic deformations, climatic perturbations, and eustatic changes, during the late Holocene, integrating geomorphometric and chronological (OSL) techniques and related these channel changes with Indian Summer Monsoon fluctuations. She also presented a poster on "Multi-metric assessment of river hydromorphology for reach prioritisation and implementation of Nature-based Solutions" at the conference, which highlighted the suitability of multi-metric hydro-morphological approaches for assessing stream health and the effectiveness of cost-efficient nature-based solutions in mitigating riverbank erosion.*

Jereem Thampan, *a PhD graduate student from DST – Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow, under the supervision of Dr Jyoti Srivastava (Scientist E, DST - BSIP Lucknow) and Prof Mahesh Sankaran (Professor, TIFR – NCBS Bangalore), received the ANRF International Travel Support to attend the 62nd Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2026) held at Xishuangbanna, China.*

The ATBC is a global association of researchers and policymakers who work on the ecology and biodiversity conservation of tropical ecosystems. Its annual meetings feature talks, symposia, and workshops on new findings in tropical biodiversity, changes in tropical ecosystems, the threats ecosystems face, and methods to conserve tropical biodiversity. The conference theme for this year was "Achieving a Shared Ecological Civilisation for Long-Term Resilience".

The Jereem chaired a symposium titled, "How are climate change and human disturbances altering the floral distribution in tropical dryland regions?" and also delivered a talk titled, "Modelling the Potential Vegetation Changes to Past and Future Climate Scenarios in Indian Drylands".

The talk featured vegetation changes in the Northwestern Indian drylands due to climate change and human disturbances, and how these are affecting the region's endemic vegetation. His results indicated a future shift in vegetation from arid to semi-arid dominance, which may drive many arid plants to extinction.

The ANRF's travel support for researchers to attend and present their findings on global stages helps many who don't have adequate funding. Schemes like this will enhance science and help showcase the country's science on a global stage.

Prof. R. Baskar, elected as Secretary of the International Geoscience Education Organisation (IGEO)

Professor Ramanathan Baskar of IGNOU's School of Sciences has been chosen as the Secretary of the International Geoscience Education Organisation (IGEO) for four years from 2026 to 2030. The International Geoscience Education Organisation (IGEO), affiliated with the International Union of Geological Sciences (IUGS), is a worldwide organisation dedicated to advancing geoscience education. The organization's core aims are to promote geoscience education internationally across all stages, elevate the global quality of geoscience teaching, and advance initiatives that deepen public comprehension of geoscience, with a special focus on youth. Prof. Baskar's role will focus on enhancing global partnerships in geoscience education, thereby advancing IGEO's objectives in Earth science instruction, educational materials, and professional growth for educators at all levels of academia internationally. The election signifies his deep involvement and consistent efforts to promote geoscience education and outreach across India and internationally.

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Dr. Arvind Tiwari, *Research Scholar, BSIP, Lucknow, under the supervision of Dr. Binita Phartiyal (Scientist F, DST - BSIP Lucknow), received the ANRF International Travel Support to attend the European Geosciences Union (EGU) General Assembly 2026, held in Vienna, Austria, from 03–08 May 2026*

Jereem Thampan, *a PhD graduate student from BSIP Lucknow, under the supervision of Dr Jyoti Srivastava (Scientist E, DST - BSIP Lucknow) and Prof Mahesh Sankaran (Professor, TIFR – NCBS Bangalore), received the ANRF International Travel Support to attend the 62nd Annual Meeting of the Association for Tropical Biology and Conservation (ATBC 2026) held at Xishuangbanna, China.*

Ms. Sonali Das, *Research Scholar, IIT Kharagpur, was selected for a short-term research visit to GFZ, Potsdam, and FU Berlin under the 'See D-World (Doctoral World Exposure) Scheme',*

Mr. Akash Kumar Srivastava *Research Scholar at IIT (BHU), Varanasi, received a travel grant from the Oxford Food Symposium to attend and present his research paper at the conference, held from 10 to 12 July 2026 at St. Catherine's College, Oxford.*

nature COMMUNICATIONS

NEW FINDINGS

Centennial-scale intensifications of the Atlantic Meridional Overturning Circulation during Heinrich Stadial 1

Lead Author: Dr. Partha Sarathi Jena
Postdoctoral Researcher, Institute of Marine Sciences, Shantou University, China.
Visiting Professor, Department of Geology, Fakir Mohan University, India.

The study of Heinrich Stadial 1 (HS1; 17.8-14.8 ka) is important because it represents a past scenario in which the Atlantic Meridional Overturning Circulation (AMOC) was strongly weakened. Therefore, HS1 provides a useful natural example for understanding how the climate system may respond to a possible future weakening of the AMOC. Such periods are especially important for assessing changes in ocean ventilation, interhemispheric heat transport, tropical rainfall, and atmospheric CO_2. In this study, AMOC variability during the last deglaciation was reconstructed using both proxy data and model simulations. The proxy record is based on highly resolved benthic-planktic radiocarbon ventilation ages from a marine sediment core in the western equatorial Atlantic, with an average temporal resolution of ~ 150 years between samples. The model results support the interpretation that ventilation ages at this site are sensitive to AMOC strength, especially when the AMOC is weak. The record shows that mid-depth Atlantic waters were poorly ventilated during HS1, consistent with a weakened overall AMOC. However, the AMOC was not continuously weak or stable. Instead, two short-lived intensification events occurred within HS1, at 16.5-15.8 ka and around 15.4 ka. These brief AMOC strengthening events likely increased northward heat transport, shifted tropical rainfall belts, reduced precipitation over northeastern Brazil, and helped flush carbon-rich mid-depth Atlantic waters toward the Southern Ocean, contributing to rapid atmospheric CO_2 rises. Overall, the study shows that the weakened AMOC state during HS1 was less stable than previously thought.

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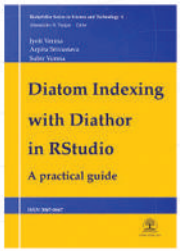

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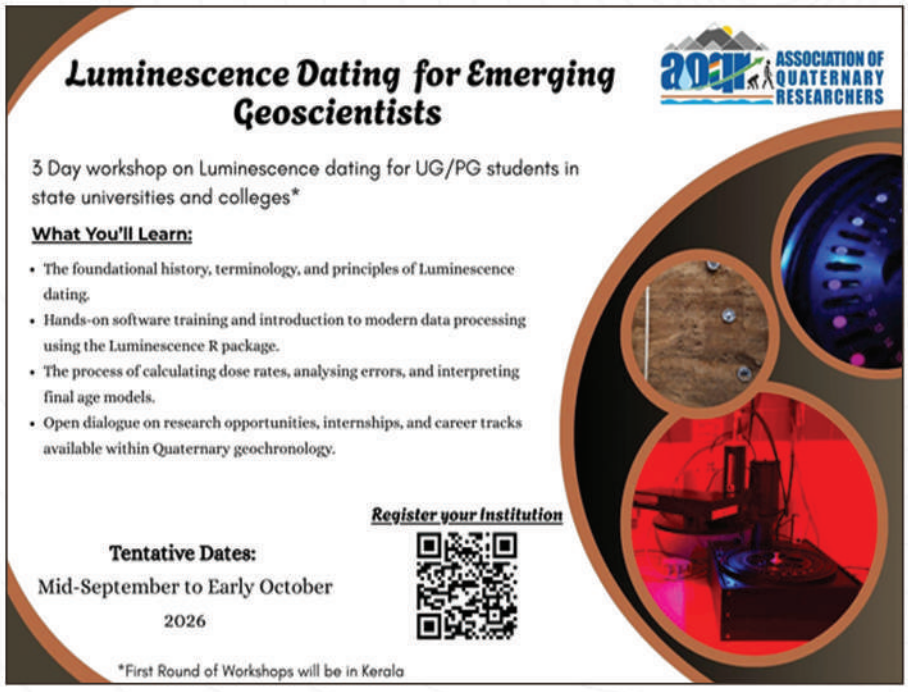
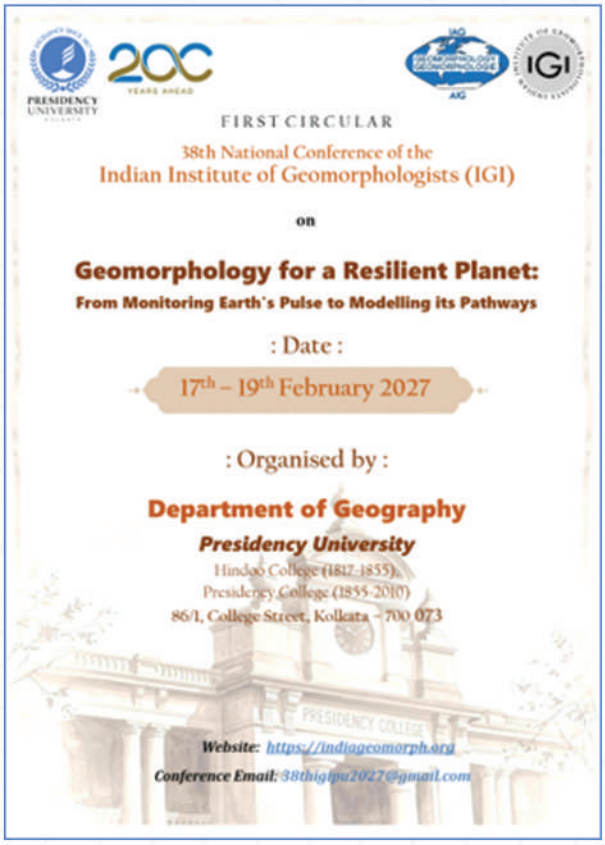
Upcoming EVENTS

The Geohazard and Geomorphology Lab offers an open PhD candidate position. The project title is: "Reconstruction of environmental conditions of the Lahaul and Spiti region, NW Himalayas, in the light of radioisotope dating, geochemical and sedimentological analyses". If you are interested, please see the full information here:
https://www.mssd.us.edu.pl/en/wp-content/uploads/2026/06/US_1_2026_ENG.pdf
The deadline for applicants is 24 August 2026.
The details about the admission requirements to the International Environmental Doctoral School of the University of Silesia in Katowice, Poland, can be found here: https://www.mssd.us.edu.pl/en/regular-admission-2026-27/
Łukasz Pawlik (lukasz.pawlik@us.edu.pl)
Institute of Earth Sciences, University of Silesia, Poland





The 38th National Conference of the Indian Institute of Geomorphologists (IGI) will be organised by the Department of Geography, Presidency University, Kolkata, from 17th to 19th February 2027. For abstract submission and other details, please see the following link: https://shorturl.at/Kqvwc.

In India, access to geochronology training is often restricted to tier-1 institutions. Students from regional colleges frequently face long travel distances, high accommodation costs, and language barriers, making formal workshops intimidating and inaccessible. Recognising these challenges, the Association of Quaternary Researchers, India (AOQR) is organising decentralised regional workshops to bridge this gap. The first series of workshops will focus on Luminescence Dating and will be hosted across selected regional hubs in Kerala.

Quaternary Chronicles
Happenings in the Sub-continent
ASSOCIATION OF QUATERNARY RESEARCHERS

Quaternary Chronicle (QC) publishes three issues a year seeks to publish perspectives, recently published peer-reviewed papers in Quaternary science, new developments in Quaternary science methods/ techniques, past events, awards, abstracts of recently awarded Ph.D./MS thesis; Quaternary publications, obituaries and details on forthcoming conferences/opportunities/fellowships the world over. Each issue of the newsletter will therefore, comprise news on on/from the Indian sub-continent;. It will also have a platform for discussion on emerging questions and ideas in Quaternary science and details on new books/ monographs/ reviews. QC seeks to share original results, new ideas and innovative development for the common good and a possibility to serve as a catalyst for the initiations of major and coordinated initiatives in the country.

We now accept submissions for our upcoming issues. Submit all the contributions to ***aoqr2019@gmail.com****. Themes for contributions are given below:*

1.Perspective: *Perspective write-ups on emerging trends and new possibilities in Quaternary Science (500 words).*

2.Sneak-peek and Discussion: *Share any exciting findings/questions from your ongoing (unpublished) work already to facilitate discussion. Any other intriguing facts/ unanswered questions are also welcomed for discussion (150 words).*

3.Significant new manuscripts/ books/ monographs/ reviews: *Corresponding authors of recently published peer-reviewed papers are invited to submit a brief summary of their work (not published abstract) with complete reference, web-link, and corresponding email address (200-300 words). Also, include a PDF copy of the paper in the email (for reference only).*

4.Facilities and Instruments: *A list of available facilities at various Indian institutes will be given and updated as contributions are received. In-charge of the available facilities, mentioning whether it is open access or available on payment basis, may submit the details with contact details.*

5. Achievements: *Share national or international awards/ fellowships/ recognitions with the larger Quaternary community. Also, approved SERB/ DST/CSIR/ national/ international Quaternary projects with the title, affiliation details of the awardee and a brief abstract (200 words) may be submitted with a copy of the award letter (for reference only).*

6.Projects/Collaborations: *New projects and collaborations related to Quaternary Science may also be sought for enhancing the quality of ongoing/proposed research. Submit a brief summary of the project, collaborations required and the contact details for correspondence (200 words).*

7. New Thesis: *Abstracts of awarded PhD/MS degree are invited for contribution (250 words).*

8.Opportunities: *Submit details with web-link of any new openings and opportunities for wider circulation.*

9. Social media: *Follow, discuss and share Quaternary India News on https://twitter.com/ AOQRIndia (Twitter) and https://www.facebook.com/ AOQRIndia (Facebook).*

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See the details in https://www.aoqr.org/#

ISSUES	Deadlines (Last date for submission)
Issue -1 (April)	**March 10**
Issue -2 (August)	**July 10**
Issue -3 (December)	**November 10**

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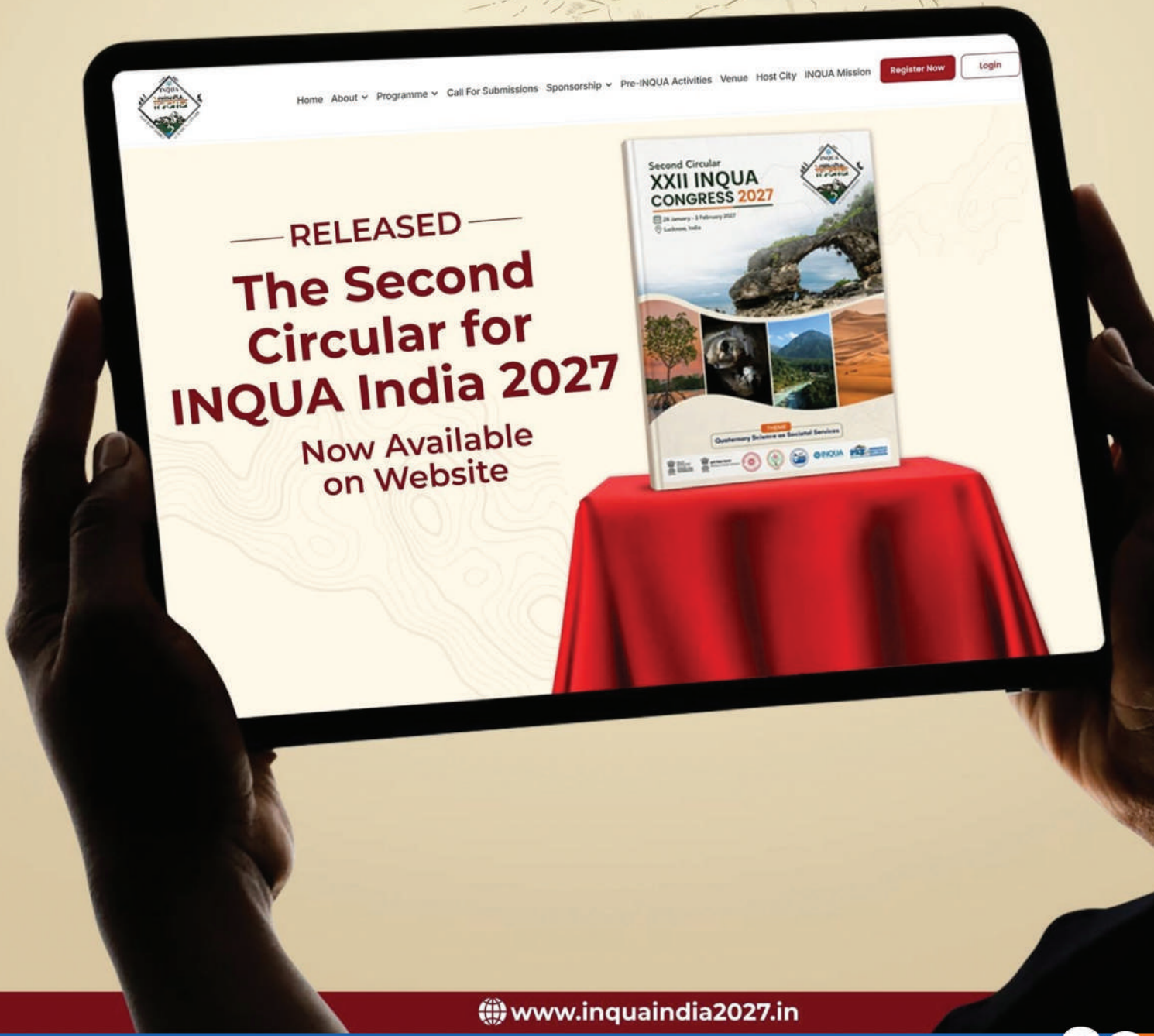

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