ASSOCIATION OF QUATERNARY RESEARCHERS

Quaternary Chronicles

Happenings in the Sub-continent

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THE 8th ANNIVERSARY ISSUE

FROM THE AOQR DESK



Dear Quaternary enthusiasts,

It gives me immense pleasure to present the April issue of Quaternary Chronicles on behalf of Dr. Vandana Prasad, President, AOQR. This issue reflects a period of vibrant scientific engagement and collective progress within the Quaternary research community.

This quarter has been marked by a series of significant activities of AOQR and INQUA. The successful organization of the 3rd Indian Quaternary Congress 2026 at IITM, Pune, in January 2026 stands as a testament to the growing strength and cohesion of our Quaternary scientific community. The Congress witnessed enthusiastic participation, high-quality scientific deliberations, and meaningful interdisciplinary exchanges, further reinforcing India's important role in global Quaternary research. A special word of appreciation goes to Dr. Naveen Gandhi, IITM Pune, and the entire organizing team/committee for the excellent execution of the event. Dr. D.P. Aggarwal Memorial two-day Geological Field-Workshop in the Karewa Formation, Kashmir, was organized in February as part of the INQUA Pre-Activity. Special thanks to Dr. Reyaz Ahmad Dar, Dr. Malik Zubair Ahmad, and their team from the University of Kashmir for a successful event. We were also honoured by the visit of the INQUA Executive Committee this February, under the leadership of Prof. Laura Sadori, President, INQUA, which provided an excellent opportunity for fruitful discussions and strategic planning at DST, New Delhi, and BSIP, Lucknow. These interactions laid a strong foundation for the successful organization of the upcoming INQUA Congress in 2027, and we look forward to building on this momentum in the months ahead.

A significant milestone during this period has been the launch of the new AOQR website (www.aoqr.org), which will serve as a dynamic platform for communication, collaboration, and dissemination of scientific activities. I encourage all members to actively engage with this platform. I also warmly welcome the new members who have joined AOQR and invite others working in allied fields to become part of this growing network, as your participation is vital in strengthening our collective scientific endeavours. I would also like to congratulate the AOQR Early Career Network (ECN) team on its formation and on the initiation of its activities. This marks a significant step toward fostering inclusivity, mentorship, and active engagement of young researchers within the community. This issue also carries a note of deep sorrow as we remember Dr. Subhash Bhandari, an esteemed Quaternary scientist whose contributions to the field will be cherished. His loss is deeply felt across the community.

Last but not least, I extend my sincere appreciation to Prof. A. K. Singhvi, Prof. S. K. Tandon, and Dr. Rahul Mohan for their insightful and engaging discussions for the INQUA 2027 podcasts season 5 (Spotify), to all the contributors of Season 4, and to Ms. Veera Singh for conducting the interviews and bringing the episodes with great skill. I sincerely thank all the contributors to this issue of Quaternary Chronicles, as well as the Editorial team for meticulously bringing it to publication. As we move forward, let us continue to work together to advance Quaternary science through collaboration, innovation, and a shared vision.

With best wishes till the next issue of Quaternary Chronicles.

- Binita Phartiyal
Secretary, AOQR
General Secretary, INQUA 2027

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To join QuatChron_AOQR Google Group:
Open https:// groups.google.com, login (using Gmail account), search for "QuatChron_AOQR" and ask to join.]



As this is a community-driven newsletter, the role of the ECR team is limited to copy editing and reporting only. It will be the sole responsibility of the author/ contributor to ensure the accuracy and authenticity of the contributions. The ECR team is pro-active in collecting as much useful information as possible; however, we rely on community inputs and will not be responsible for any omissions.



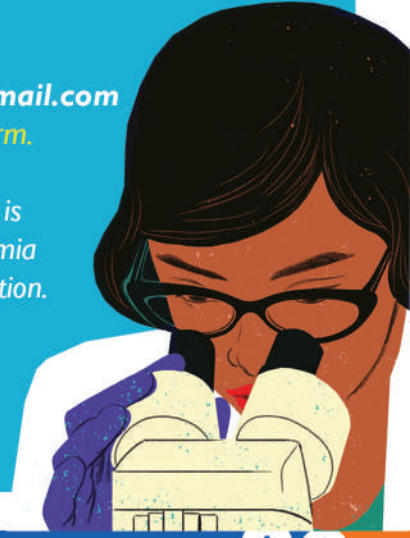
AOQR MEMBERSHIP CALL

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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Executive Council Meeting & Site Visit (16–22 February 2026)

Compiled by: Dr. Pradeep Srivastava, IIT-Roorkee (Vice President, INQUA; President INQUA India 2027).

The INQUA Executive Council (EC) convened in New Delhi from 16 to 22 February 2026 for its Annual General Meeting. During their visit, the EC members also met with officials from the Department of Science and Technology (DST), including the Joint Secretary, Shri Sunil Kumar, to review the progress of preparations for the INQUA 2027 Congress.

The meeting at DST began with introductions, followed by briefings from Dr. Usha Dixit and Dr. Manoranjan Mohanty, who outlined the agenda and the current status of preparations. This was followed by detailed discussions between Shri Sunil Kumar and the INQUA EC on the organizational progress of INQUA 2027. Dr. Pradeep Srivastava presented an overview of the scientific programme, proposed field trips, and related components. Dr. Binita Phartiyal provided updates on the various arrangements BSIP is undertaking in preparation for the Congress. Key issues, including potential bottlenecks related to visa processes and associated logistical challenges, were discussed in detail, and possible solutions were proposed to facilitate the smooth participation of international delegates. A welcome dinner in honour of the INQUA EC members was hosted at the India Habitat Centre. The event was attended by several Delhi-based colleagues, including officials from DST and the Ministry of Earth Sciences (MoES), as well as distinguished scientists such as Dr. D. M. Banerjee and Dr. Rasik Ravindra.




Meeting with the DST Officers in New Delhi





Following the Delhi meeting, the INQUA EC visited Lucknow to further assess the preparedness for the Congress and see the venue. The council inspected the proposed venue, Indira Gandhi Pratishthan, accompanied by the BSIP team. The EC conducted a comprehensive tour of the facility and held detailed discussions on broader planning aspects, including the technical oral and poster sessions and the exhibition (expo) area. Prof. M. G. Thakkar, Director of BSIP, formally felicitated the EC members and assured them of full institutional support, including necessary financial arrangements and smooth execution of the event. The EC also interacted virtually with the appointed Professional Conference Organizer (PCO) to review plans for the congress mobile application and other logistical components.











The BSIP team efficiently facilitated all logistical arrangements during the visit and hosted a dinner in honour of the EC members. The visit concluded with a positive note, reflecting strong coordination among all stakeholders and steady progress toward the successful organization of INQUA 2027.

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Quaternary Sciences and Just Transition- bridging the gap between science and policy framework

Sreya Sengupta,
Just Transition Research Centre, Indian Institute of Technology Kanpur



Quaternary Science is an interdisciplinary field that focuses on the past 2.6 million years, spanning the Pleistocene and Holocene. It is like a vast ocean encompassing subfields of Earth Science, such as paleoclimatology, geomorphology, paleoceanography, archaeology, geochronology, paleoecology, marine geology, paleolimnology, and many more, with increasing input from indigenous communities. Quaternary Science deals with past climate variability, glacial-interglacial dynamics, human evolution, diversity, and extinctions of both megafaunal and microfaunal assemblages from the Pleistocene, shifts in ecological abundances caused by climate change, including extreme events, climate tipping points, and the development of robust dating methods. Just Transition, on the other hand, is a policy framework emerging globally through decarbonization and a shift towards net-zero policies, especially in the context of excessive use of fossil fuels since the industrial era. It provides a fair, just, and equitable net-zero economy that aims to include all sections of society and environmental justice. It aligns with Sustainable Development Goals 7, 10, and 13 of the UN, covering clean energy, reduced inequalities, and climate action, respectively. This also aligns with the 2027 INQUA theme "Quaternary Sciences as Societal Service".

Even though these subjects are historically separate, the scope of Quaternary Science's contribution to the field of Just Transition is significant. Quaternary geomorphology identifies changes in post-mining landscapes and the original landforms in a mining region. For example, mine reclamation at the El Macchero Mine in Spain used geomorphic techniques that led to the construction of smart watersheds. Paleolimnological and paleoecological studies have also been used to monitor anthropogenic modification in active mining lakes and to inform remediation and recovery efforts.

The diverse archives of Quaternary Sciences include ocean cores, ice cores, lakes, speleothems, tree rings, peat, and bogs. Quaternary records can identify regions of heightened exposure to climate-related hazards and extreme events, including cyclones, heat waves, blizzards, drought, sea-level rise, and famine. The Bay of Bengal region provides a classic example. Supercyclone Alia in 2009 caused massive damage and loss of human life and property in the coastal districts of Odisha and West Bengal.

In the last decade, cyclones have become very common in the Bay of Bengal, namely Titli (2018), Fani (2019), Amphan (2020), Yaas (2021), Remal, and Dana (2024), indicating an intensification of cyclonic activity. Paleolimnological studies in coastal lakes of the USA have revealed a similar scenario, with an increase in the frequency and intensity of paleohurricane records from granulometric analyses. With the Ministry of Earth Sciences (2020) projecting a significant increase in climate disasters under rising temperatures, paleolimnological baselines can provide the evidentiary foundation for directing adaptation investments toward the most exposed communities - translating Quaternary science directly into Just Transition commitments.

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Between Science And War:
A Journey Of Hope And Uncertainty

I travelled to attend the Ocean Sciences Meeting 2026 with a heart full of purpose. As a researcher working on oceans, climate, and the past behaviour of Earth systems, the conference in Glasgow, Scotland, was a place where hope felt real. Scientists from every corner of the world had gathered not for competition or conflict, but for one shared goal to understand our planet and protect the future of humanity.

In the conference halls, there was an atmosphere that was difficult to describe. Posters lined the walls, conversations flowed across languages and cultures, and ideas moved freely between people who, outside that room, belonged to different nations and political systems. There, science created a space where borders did not matter. Presenting my research among such brilliant minds filled me with motivation. I returned from the conference carrying new ideas, new collaborations, and a renewed belief that science has the power to guide humanity toward a better future.

But the world outside the conference hall was very different.

During my return journey, geopolitical tensions and war-related disruptions in western Asia led to flight cancellations. Suddenly, the journey home turned into days of uncertainty. I found myself stranded in the vast terminals of London's Heathrow Airport. Airports are usually places of movement and reunion. That day, however, it felt like a space suspended between hope and helplessness. Passengers from different countries sat silently beside their luggage, refreshing their phones for updates that never seemed to come. The departure boards glowed with the same message again and again: Cancelled. Delayed. Cancelled.

In those long hours of waiting, a strange feeling grew inside me. Just a few days earlier, I had been surrounded by scientists discussing ocean circulation, climate systems, and the fragile balance of Earth's environment. We spoke passionately about how science could help humanity face the challenges of the future, rising seas, changing monsoons, and global climate change.



But now, sitting in the airport, I felt that hope slowly fading.

The same humanity that scientists work so hard to protect was caught in conflict. The same world that needs cooperation to survive seemed divided by war and political tensions. My journey home became a moment of reflection. The excitement and optimism I had carried from the conference began to feel fragile. I realised something deeply paradoxical: while scientists across the world dedicate their lives to understanding the planet and protecting humanity, conflicts between humans continue to interrupt that very mission. At the conference, people from countries that may disagree politically shared data, knowledge, and friendship. But outside that scientific community, those same nations could be separated by mistrust and conflict. Stranded in that airport, I felt the weight of this contradiction. Yet even in that moment of uncertainty, another thought emerged. The hope that science creates does not easily disappear. It survives through curiosity, collaboration, and the determination of people who believe that knowledge can build a better world.

My journey home may have been delayed, and my optimism shaken for a moment, but the purpose of science remains unchanged. Science exists because humanity still believes that understanding the Earth can help protect it. And perhaps that belief, quietly shared by researchers across the world, is one of the strongest forms of hope humanity still has.

- Adhra Renny, *BSIP, Lucknow*



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INQUA 2027 PODCAST

The podcasts aim to simplify the concepts of Quaternary Science in the context of the Indian subcontinent.

Season 4 (2025)

Episode 7: *Mawmluh Cave in Northeast India:The birthplace of the Meghalayan age - December 15, 2025*
Dr. Swati Tripathi, Dr. Nivedita Mehrotra & Veraa Singh

Episode 8: *Quaternary Sea-level Changes - December 28, 2025*
Dr. K. Anbarasu, Dr. S. Senthil Kumar & Veraa Singh

Season 5 (2026)

This season, our RJ Veera Singh interviewed some legendary Quaternary scientists. Please listen to Prof. A. K. Singhvi, Prof. S. K. Tandon, and Dr. Rahul Mohan on Spotify. The Podcast series Season 5 aims to provide a platform for introducing advances in Indian Quaternary Sciences to the scientific community and the general public.

Episode 1: In Conversation with: Prof A.K. Singhvi (Part 1)
January 26, 2025 - ***Prof. A.K. Singhvi & Veraa Singh***

Episode 2: In Conversation with: Prof A.K. Singhvi (Part 2)
January 28, 2025 - ***Prof. A.K. Singhvi & Veraa Singh***

Episode 3: In Conversation with: Prof S.K. Tandon
February 17, 2026 - ***Prof. S.K. Tandon & Veraa Singh***

Episode 4: In Conversation with: Dr. Rahul Mohan
March 15, 2026 - ***Dr. Rahul Mohan & Veraa Singh***

PODCAST Content Creators





3rd Indian Quaternary Congress (IQC-2026)

Report compiled by Dr. Naveen Gandhi, IITM-Pune

The 3rd Indian Quaternary Congress was jointly organised by the Indian Institute of Tropical Meteorology (IITM), Pune, and the Agharkar Research Institute, Pune, in collaboration with the Association of Quaternary Researchers from 21-23 January 2026 at IITM, Pune. It was convened by Dr. Naveen Gandhi. The august gathering aimed to promote discussion of advances, challenges, and emerging directions in Quaternary science, with particular emphasis on the theme "Tracing Earth System Dynamics and Human-Environment Interactions through the Quaternary." The conference was co-funded by the Indian National Centre for Ocean Information Services (INCOIS), the National Centre for Polar and Ocean Research (NCPOR), Thermo Fisher Scientific, and Elementar.

The scientific programme was structured around the following themes:

Theme 1- Ocean, Polar & Cryospheric Systems (including the Himalayas)
Theme 2- Biodiversity, Biogeography & Evolution
Theme 3- Terrestrial Processes & Paleoclimate



Theme 4- Methods, Modelling & Applications
Theme 5- Human-Climate Interactions and Societal Evolution

IQC-2026 was inaugurated by Dr. M. Ravichandran (Secretary, MoES), Prof. N.V. Chalapathi Rao (Director, NCESS), Dr. Suryachandra A. Rao (Director, IITM), Dr. P. Dhakephalkar (Director, ARI), Dr. Binita Phartiyal (Secretary, AOQR), and Dr. Suvarna Fadnavis (Project Director, CCCR-IITM). It included 6 plenary lectures and 18 invited talks by senior scientists from IITM, BSIP, PRL, NCESS, IIT-Bombay, IIT-Delhi, IIT-Kanpur, Deccan College, NCPOR, IISER-Pune, IISER-Mohali, ATREE, ARI, BGRL, University of Delhi, University of Hyderabad, Anna University, and TIFR-Mumbai. A total of 94 abstracts were received, out of which 32 were selected for oral talks, and the remaining were presented as posters. Around 140 registered participants and delegates across Earth Science, Environmental Science, and related disciplines attended the scientific sessions, reflecting broad scientific engagement in Quaternary and paleoclimate research. It was also participated in by early-career researchers from international universities in Taiwan, Australia, and Belgium, underscoring the conference's growing international presence. The research scholars were evaluated on their presentations and awarded the best oral and poster certificates and mementos.



The conference was preceded by a two-day National Training Workshop on Stable Isotopes in Paleoclimatology, conducted by the Development of Skilled Manpower in Earth System (DESK), MoES, Govt. of India, and the paleoclimatology team at CCCR, IITM-Pune, from 19-20 January 2026. It attracted



several postgraduate, PhD scholars, and Early-career researchers, of whom 35 were selected for the course. The workshop featured 6 talks on the basics and advanced aspects of stable isotopes and their applications in paleoclimatology. The experts were senior scientists from PRL-Ahmedabad, IIT-Kharagpur, IISER-Pune, IISc-Bengaluru, and NCPOR-Goa. The lectures were also accompanied by visits to the Isotope and Dendro Labs at IITM and interactive sessions with the participants.

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AOQR - Early Career Network (ECN)

AOQR - Early Career Network was officially launched at the Third Indian Quaternary Congress (IQC-2026). This network aims to connect, mentor, and empower early-career researchers in the Quaternary through collaboration and leadership opportunities, marking a significant milestone in the landscape of Indian geosciences. The Early Career Network follows and supports the AOQR mission of fostering Quaternary Science in India. The ECN aims to be a stepping stone for researchers transitioning from students to independent professionals by providing training in transferable skills, science communication, and welfare.

Following a formal call for applications in November 2025, the AOQR underwent a rigorous and competitive selection process to identify its inaugural leadership team. From a diverse pool of applicants, five postdoctoral researchers and 10 PhD students were selected as official representatives, bringing together a dynamic mix of expertise and fresh academic perspectives to steer the network's mission. The selected representatives constitute a geographically diverse body, drawing on talent from national institutions across India and international universities.



Dr. D.P. Aggarwal Memorial Pre-INQUA 2-Day Geological Field-Workshop in Karewa, Kashmir. February 16 & 17, 2026

Compiled by Dr. Reyaz A Dar and Dr. Malik Zubair Ahmad, University of Kashmir.



Dr. D.P. Aggarwal Memorial Pre-INQUA 2-Day Geological Field-Workshop was organized by the University of Kashmir, on 16-17 February 2026. As part of the pre-INQUA activity, the field workshop was organized by Dr. Reyaz Ahmad Dar and Dr. Malik Zubair Ahmad, Assistant Professors at the Department of Earth Sciences, University of Kashmir, with support from ANRF (DST), and MoES, New Delhi. The inaugural Program was graced by Prof. M. Sultan Bhat (Dean for Research, University of Kashmir), Dr. Vinod Kumar (Director, GSI, Jammu Office), and Dr. Abdul Qayoom Paul (Director, GSI, Kashmir Office). 30 participants from different universities and institutes of the country attended the workshop. Dr. Reyaz A Dar, in his welcome address, outlined the scientific importance of the Quaternary deposits of Kashmir Valley and the objectives of the pre-INQUA initiative. He emphasized that Quaternary deposits of the Kashmir Valley represent one of the thickest, best-preserved, and most accessible records of environmental change in the Indian subcontinent. Prof. Mohd. Sultan Bhat, the chief guest of the occasion, highlighted the urgent need for systematic identification, documentation, and preservation of the Karewa deposits and related Quaternary archives, recognizing their immense importance in reconstructing

the paleoclimatic and paleoecological history of the Kashmir Valley. Dr. Vinod Kumar, Director of the GSI Jammu Office, delivered the keynote address, highlighting the national scientific relevance of Kashmir's Quaternary sequences for understanding climate variability, geomorphic evolution, and environmental change. Dr. Abdul Qayoom Paul, Director, GSI Kashmir Office, delivered remarks emphasizing the importance of sustained institutional linkages between academia and national geoscientific agencies for high-quality field research and conservation of key type sections of the Quaternary. The technical component included a presentation on "Quaternary Deposits of Kashmir Valley" by Dr. Reyaz Ahmad Dar, providing participants with a scientific framework for the subsequent field investigations. The workshop featured extensive fieldwork to expose participants to key paleoclimate archives and classic Quaternary sections of the Kashmir Valley. On Day 1, field investigations include visiting Wanihama and MakhaiBagh LPS (Dilpur Formation) of Late Quaternary age. Day 2 includes visits to the type sections of the Lower and Upper Karewa of Quaternary age, including the Nagum section (type section of Methowin and Pampore Members), the Khan Sahib section (type section of the Dilpur Formation), and the Waterhail section representing the Dubjan and Rambiera Members of the Lower Karewa. Field discussions, hands-on experience with essential techniques such as section measurement and sampling for Quaternary climatic analysis and on-site interpretations across the various types of sections of Quaternary deposits were facilitated by a team of resource persons comprising Dr. Reyaz Ahmad Dar, Dr. Rayees A. Shah, Dr. Vinod Kumar, Dr. Abdul Qayoom Paul, Dr. Zameer A Shah, Dr. Malik Zubair Ahmad, Dr. Sarah Qazi, Dr. Wasem Qader, and Dr. Omar J. Paul.

The vote of thanks was proposed by Dr. Malik Zubair Ahmad, who sincerely thanked the resource persons, participants, ANRF (DST), and MoES, New Delhi, for their financial support, and the University of Kashmir for providing the opportunity to organize this important event.

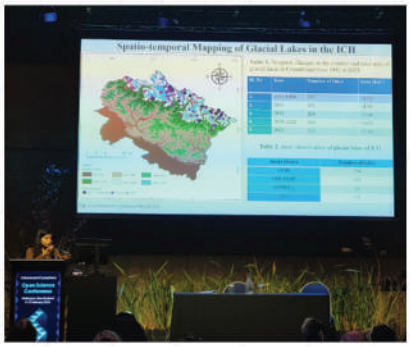


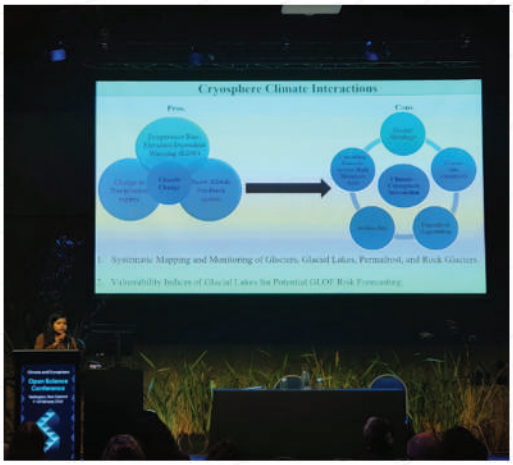
Participation In the Climate and Cryosphere (CLIC) Open Science Conference 2026, Wellington, New Zealand 9–12 February 2026

Mitra Rajak, CSIR-UGC SRF, BSIP Lucknow.

I, Mitra Rajak, Senior Research Fellow (SRF) enrolled at the Academy of Scientific and Innovative Research (AcSIR) and working under the supervision of Dr. Sheikh Nawaz Ali at the Birbal Sahni Institute of Palaeosciences (BSIP), participated in the Climate and Cryosphere (CliC) Open Science Conference 2026 held from 9–12 February 2026 in Wellington, New Zealand. During the conference, I delivered an oral presentation titled "Critical Glacial Lakes and Emerging Threats in the Indian Central Himalaya." My presentation focused on the increasing formation of glacial lakes in the Indian Central Himalaya and the potential risks associated with glacial lake outburst floods (GLOFs). The study emphasised the importance of continuous monitoring, hazard assessment, and scientific understanding of glacier–climate interactions in high mountain regions. My participation in this international conference was supported by the Anusandhan National Research Foundation through the International Travel Scheme (ANRF-ITS). The conference provided an excellent platform to present my research and engage with the global cryosphere research community. During the meeting, I had the opportunity to interact with several leading scientists from around the world. In particular, I had a valuable interaction with Prof. Shin Sugiyama from the Arctic Research Center and the Institute of Low Temperature Science at Hokkaido University, during which we discussed glacier dynamics, cryosphere monitoring, and potential research perspectives in Himalayan glacier studies. Overall, participation in the conference provided significant exposure to the latest developments in climate and cryosphere research, facilitated scientific exchange, and helped in building international research connections.









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Scientific Participation and Networking Report: Ocean Sciences Meeting 2026

Adhra Renny, BSIP, Lucknow

I attended the Ocean Sciences Meeting 2026 held in Glasgow, Scotland, from 22-27 February 2026. The conference was jointly organised by leading scientific bodies, including the American Geophysical Union, Association for the Sciences of Limnology and Oceanography, and The Oceanography Society. The meeting brought together researchers from around the world to discuss recent advances in oceanography, climate dynamics, marine ecosystems, and biogeochemical cycles. During the conference, I presented my research work titled "Deciphering the sedimentary responses of the monsoon seasonality and intermediate water circulation in the Southeastern Arabian Sea during the last 200 ka" as an oral presentation. The presentation focused on reconstructing past monsoon variability, sedimentary processes, and changes in ocean circulation in the southeastern Arabian Sea using multiproxy sediment records. The session facilitated fruitful scientific discussions with experts working on paleoceanography, monsoon dynamics, and Indian Ocean circulation. Participation in the conference provided an excellent opportunity to interact with international researchers and establish new scientific connections. I engaged in discussions with several scientists working in paleoceanography, sedimentology, and climate reconstruction, which may lead to future collaborations. I had the opportunity to interact with renowned marine geologist and geophysicist Prof. Peter Clift and discuss sediment provenance, monsoon-driven sedimentation, and Indian Ocean paleoceanography. Such interactions were highly valuable for gaining insights into current research directions in the field. I also introduced colleagues and participants to the upcoming INQUA Congress and invited them to participate, thereby promoting the event among the global Quaternary science community. An especially memorable aspect of my participation was a creative outreach initiative during the conference. I composed a short poem about my research topic directly at the conference venue, presenting the scientific narrative of Arabian Sea paleoceanography in a creative form. This effort attracted attention from fellow participants and organisers, and the poem was acknowledged during the conference's closing ceremony, highlighting the importance of innovative science communication approaches for engaging the scientific community. Overall, attending the Ocean Sciences Meeting 2026 was a highly enriching experience. It provided a platform to present my research to an international audience, to gain valuable feedback, to build professional networks, and to promote upcoming scientific events. The exposure gained from this conference will significantly contribute to my ongoing research and future collaborations in paleoceanography and Quaternary climate studies.



6th Workshop of the Association of Luminescence Dating

Jayesh Mukherjee
Earth Surface Processes Research Group, Department of Geography and Earth Sciences, Aberystwyth University, Wales, UK. Email: jam169@aber.ac.uk

The 6th national workshop on Luminescence Dating & Its Applications was held at the Wadia Institute of Himalayan Geology (WIHG) in Dehradun from 10 to 12 December 2025. This pre-INQUA India 2027 event brought together a vibrant community of postgraduate researchers, early-career scholars, and scientists from across different Indian institutes. Participants working in Quaternary science, geochronology, geomorphology, archaeology, and Earth system sciences gathered for an intensive and collaborative learning experience.

Designed as a comprehensive training programme, the workshop blended hands-on field sessions with technical lectures, laboratory demonstrations, and open discussions. Attendees were introduced to the full arc of luminescence dating, ranging from selecting field sites and developing sampling strategies to navigating laboratory procedures and interpreting complex datasets. Field excursions across the Shivalik Himalayan foreland near Dehradun city provided first-hand exposure to geomorphic, sedimentary, and neotectonic settings essential for understanding and applying OSL techniques. The resource persons included Dr. K. Luirie, Dr. Paramjeet Singh, and Dr. Mahesh Kapawar from WIHG and Dr. Anil Kumar from JNU, New Delhi. The academic programme featured insightful presentations (both oral and posters) from young research scholars and early career researchers. Leading experts, including Prof. Ashok K. Singhvi (Shantou University, China and formerly at PRL Ahmedabad), Prof. Sheila Misra (formerly at Deccan College Postgraduate and Research Institute, Pune), Prof. Vimal Singh (University of Delhi), Prof. Javed N. Malik (IIT Kanpur) and Dr. Manish Mehta (WIHG) among others delivered plenary lectures in between each oral session. While Prof. Edward Rhodes (University of Sheffield, UK) and Prof. Bo Li (University of Wollongong,



Prof Ashok Singhvi is being felicitated by Prof Pradeep Srivastava at the inauguration of the ALD workshop.

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Participants' group photo along a roadside Quaternary section of the lower Shivalik Range near Dehradaun.



Australia) delivered their respective plenary lectures online. These talks highlighted the wide-ranging applications of luminescence dating, spanning archaeology, palaeoclimatic reconstruction, tectonics, and landscape evolution, and encouraged cross-disciplinary dialogue. One of the notable moments of the event was the presentation by Prof. Pradeep Srivastava (IIT Roorkee), Vice President of INQUA, who shared updates on the upcoming XXII INQUA Congress 2027 to be hosted in India. His address emphasised India's expanding role in global Quaternary research and the importance of fostering strong international scientific partnerships. Dr. Madhav K. Murari (IUAC, New Delhi), President of ALD, and Dr. P. Morthekai (BSIP, Lucknow) discussed the key outcomes of the ongoing Inter-laboratory calibration comparison project for luminescence readers at various Indian institutions. Overall, the workshop played a vital role in capacity building and community development, offering a platform for knowledge exchange and skill development. Its aims closely align with the broader vision of INQUA India 2027, i.e., to advance interdisciplinary Quaternary science and support the next generation of researchers shaping the field.

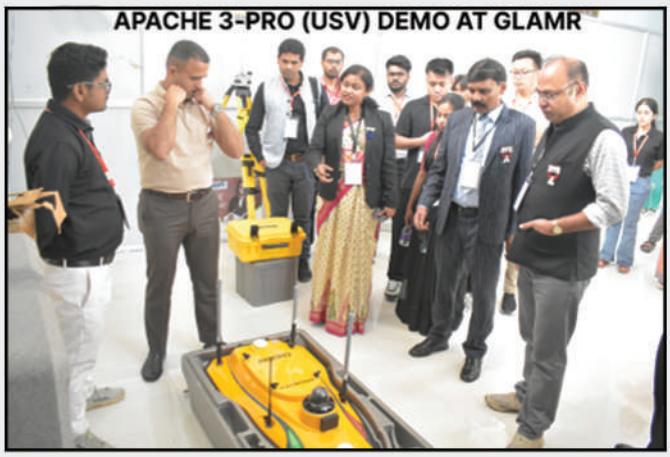
National Field Workshop on Geo-Hydrological Survey Using USV and UAV Technologies (GHSUUT)

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A three-day national-level workshop (11th-13th March, 2026) on advanced geohydrological surveying using integrated Unmanned Surface Vehicle (USV) and Unmanned Aerial Vehicle



(UAV) technologies (GHSUUT) was conducted by the Department of Geography, Nagaland University (NU), Lumami, from March 11 to March 13, 2026. The inaugural day Program was held at the Department of Geography, NU, and followed two days of intensive, hands-on training on UAVs and USVs on Majuli Island, the world's largest riverine island. Young researchers from across India, including Uttarakhand, Orissa, West Bengal, Assam, and Nagaland, participated in this program, GHSUUT. The training program was financially assisted by the Ministry of Earth Sciences (MoES) and Nagaland University.



The organizing Secretary, Dr. Manasi Debnath, introduced the programme by emphasizing that integrating UAV and USV technologies enables simultaneous collection of surface and subsurface data, which is crucial for disaster risk reduction in fragile mountain regions. She further noted that the Glacier and Mountain Research Lab (GLAMR), in collaboration with the Department of Geography, is being strengthened with advanced UAV and USV systems to enhance future geohydrological research. The Honourable Vice-Chancellor

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PIC. GROUP TRAINING PHOTO AT MAJULI ISLAND

Prof. Jagadish Kumar Patnaik acknowledged the department for successfully organizing the workshop. The remarkable spotlight of the training programme was Chief Guest, Dr. M. Ravichandran, Honourable Secretary of MOES, who graced the programme virtually and emphasized the vital interconnections among Earth's spheres, noting that such workshops are crucial for translating scientific advancements into societal benefits. He highlighted the evolution of hydrological surveys, observing that while traditional methods are time-consuming, modern techniques and data analysis are indispensable for flood risk management, dam safety, and sediment studies.


PIC. APACHE 3-PRO (USV) FIELD TRAINING IN MAJULI

The academic and training sessions featured lectures by Prof. Ajanta Goswami (Professor, IIT Roorkee), Dr. Pritam Chand (Assistant Professor, Central University of Punjab), Dr. Lunamoni Das (Assistant Professor, NERIWALM), and Dr. Anugya Shukla (Scientific Officer, IIT Jodhpur). The hands-on training sessions on UAVs and USVs continued until dusk, followed by data processing that extended into the evening. Adding a memorable charm to the programme was the ferry journey across the mighty Brahmaputra, where the serene beauty of the setting sun created a truly captivating and unforgettable experience for the participants.

Report on the Field Guide Preparation for the INQUA Pre-Conference Field Trip on "Understanding Sedimentary Environments of Majuli Island, Northeast India" (INPRE-05)

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In preparation for the INQUA Pre-Conference Field Trip on "Understanding Sedimentary Environments of Majuli Island, Northeast India" (INPRE-05), the field guide development was initiated alongside field investigations and arrangements for accommodating international delegates in Kaziranga National Park and Majuli, the world's largest riverine island. This collaborative effort, involving scientists from the North East Institute of Science and Technology (NEIST), Jorhat, who also assisted in the field, was conducted from February 2 to February 7, 2026. The financial assistance for this field investigation has been approved and will be reimbursed under the INQUA 2027 Field Program. A five-member team comprising Dr. Manasi Debnath, along with PhD scholars Ms. Priya Rani Saha and Ms. Samikcha Rai from Nagaland University (NU), and Dr. Chinmay and Mr. Priyanku from NEIST, collected multiple soil cores from in and around Kaziranga National Park (KNP) and Majuli Island for subsequent geochemical analyses. The study aims to investigate late Holocene climate variability and its influence on the dynamic

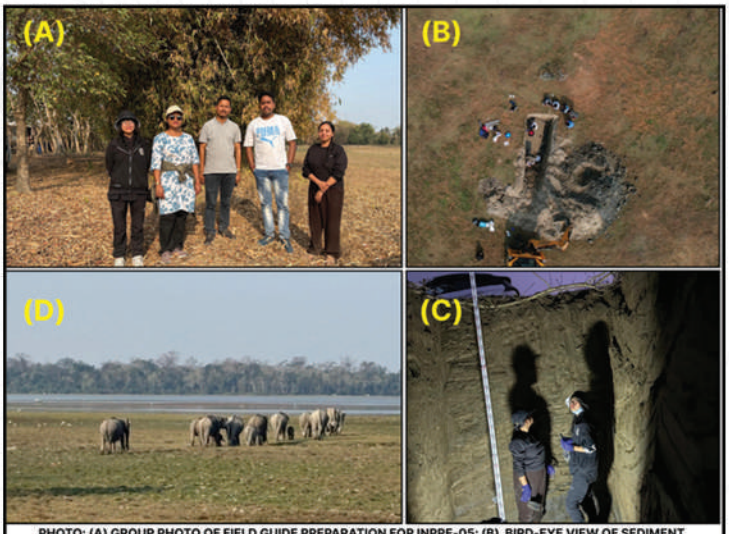


PHOTO: (A) GROUP PHOTO OF FIELD GUIDE PREPARATION FOR INPRE-05; (B) BIRD-EYE VIEW OF SEDIMENT COLLECTION IN MAJULI AS FIELD GUIDE PREPARATION FOR INPRE-05; (C) SAMPLE COLLECTION BY THE NU PHD SCHOLARS ; (D) BIODIVERSITY OF KAZIRANGA NATIONAL PARK, PHOTO TAKEN FOR INPRE-05

NEW FINDINGS

Environmental evolution of a coastal lake in the Larsemann Hills, East Antarctica during the Holocene: a multi-proxy perspective.

Joju, G.S., Warrier, A.K., Mahesh, B.S., Jadav, A., Noronha-D'Mello, C.A., Kawsar, M., Manoj, M.C., Sali,

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A.S.Y., Valsan, G., Krishnaprasad, A.A., Kokare, S., Balakrishna, K., Mohan, R., 2026. Scientific Reports 16, 9139. https://doi.org/10.1038/s41598-026-39218-8

The East Antarctic Ice Sheet, the largest on the planet, has the potential to raise global sea levels by about 53 metres. Any changes in its volume must therefore be closely monitored, as they can affect mean sea levels worldwide. Understanding the regional deglacial history and the variables controlling ice glacial behaviour is crucial in this regard. Lake sediments can play a vital role in this scenario. Coastal lakes from Antarctica provide unique records of past climatic and environmental changes. Their evolution is closely linked to variations in relative sea level (RSL) driven by deglaciation, making them ideal natural laboratories for investigating marine-lacustrine transitions and reconstructing ancient sea levels. In the present study, multi-proxy analyses have been carried out on a sediment core from Heart Lake, Larsemann Hills, East Antarctica, to gain insights into the past marine-lacustrine transitions and environmental changes in the region.

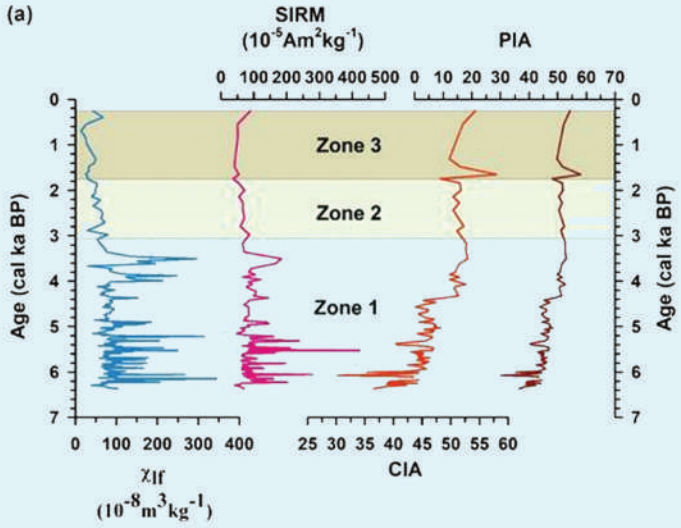
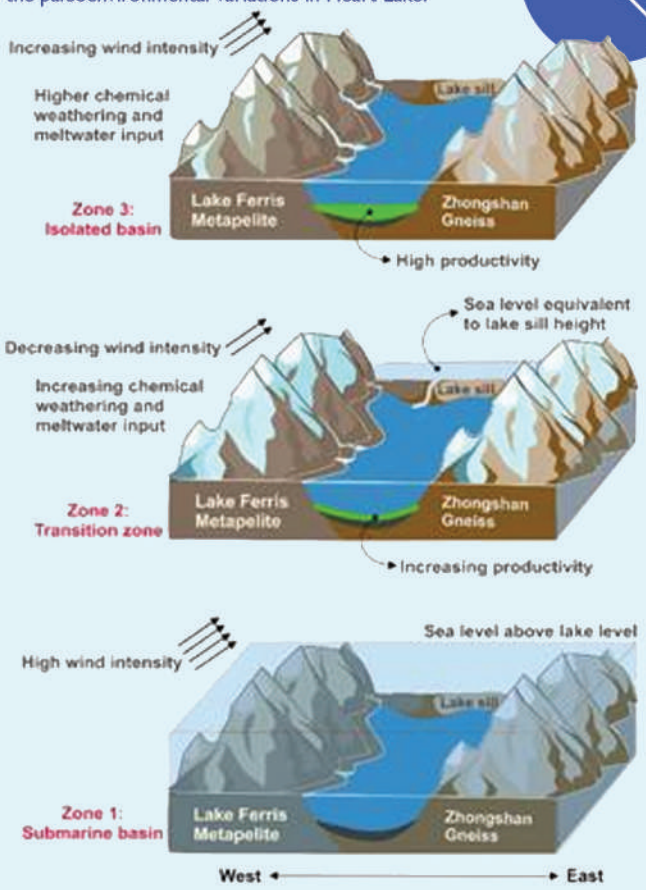


Figure 1. (a) Downcore plot of magnetic concentration dependent parameters clf and SIRM and the chemical weathering indices CIA and PIA

Based on diatom studies, we identified three distinct zones and reconstructed paleoenvironmental variations in the lake over the past 6.37 cal ka BP. During the period from 6.37 cal ka BP to 3.07 cal ka BP (Zone 1), the lake existed as a submarine basin, marked by the abundance of marine diatoms (Fragilariopsis curta). The magnetic concentration-dependent parameters and SIRM show high values in Zone 1, suggesting higher concentrations of magnetic minerals in the sediment samples, possibly reflecting an enhanced supply of glacial sediments from the nearby Dalk Glacier, located 2.5 km from the lake. The chemical weathering indices, CIA (Chemical Index of Alteration) and PIA (Plagioclase Index of Alteration), show low values in zone 1 (up to ~ 4.3 ka BP), reflecting a low degree of chemical weathering in the region during this

Figure 1 (b) Schematic model representing the paleoenvironmental variations in Heart Lake.



period. From ~ 4.3 cal ka BP, the chemical weathering indices show elevated values indicating intensified chemical weathering, suggesting the onset of warmer conditions favourable for such processes. The period from 3.07 to 1.75 cal ka BP represents a transition zone marked by an admixture of marine and freshwater diatoms (Stauroforma inermis). Zone 2 marks the onset of the isolation of ubmarine basin due to glacial isostatic uplift. The magnetic concentration-dependent parameters and SIRM show reducing values in Zone 2, while CIA and PIA show higher values, indicating reduced sedimentary input and higher intensity of chemical weathering in the catchment. The diatom data indicate the dominance of freshwater diatoms and the absence of marine diatoms in Zone 3 (1.75 to 0.25 cal ka BP), reflecting the basin's isolation and the transition to a freshwater environment. The lowest concentrations of the magnetic minerals are observed in Zone 3, coincident with the lake isolation. The chemical weathering indices CIA and PIA show the highest values in Zone 3, reflecting progressively warming conditions favourable for a higher degree of chemical weathering. The findings from this study underscore the interplay between regional climate variability, glacial dynamics, and marine-lacustrine transitions in shaping Antarctic coastal lake environments.

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Cereal and Non-Cereal Pollen Micromorphometry and Its Implications for Past Anthropogenic Activities in the Central Ganga Plain, India

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Pollen micro-morphology, particularly overall grain size and annulus diameter (the ring surrounding the pore), is a key criterion for distinguishing cultivated cereals from wild grasses and reconstructing past human influence and palaeoecology. In a first-of-its-kind study from India, 22 cereal and non-cereal species were analysed using Light Microscopy (LM), Confocal Laser Scanning Microscopy (CLSM), and Field Emission Scanning Electron Microscopy (FESEM) to establish a reliable biometric threshold. Published in the international journal The Holocene (SAGE), the study defines a clear "paired biometric threshold": cereal pollen generally exceeds 46 µm in grain diameter and 9 µm in annulus size (except pearl millet, which is smaller), while wild grasses fall below these values. This framework provides a robust tool for distinguishing cereal from non-cereal pollen in the Central Ganga Plain, India's food basket, and for accurately tracing the onset and intensity of ancient agricultural practices. This is the first time such an analogue has been developed using indigenous data from the Ganga Plain, enabling scientists to reconstruct the region's agricultural past based on local evidence rather than relying on pollen reference databases from other regions.

India is the second-largest producer of wheat and rice, the world's major food staples. Despite this, no comprehensive study has yet been undertaken to develop a detailed pollen micro-morphological analogue of major food crops and associated wild taxa of the Poaceae (grass) family. Establishing region-specific biometric thresholds for cereal and non-cereal grasses is essential for accurately reconstructing past human habitation and agricultural practices in India. The proposed biometric threshold is based on detailed analyses of the most prominent and ancient cereal crops of the Ganga Plain, including Triticum (wheat), Oryza (rice), Zea mays (maize), Sorghum (jowar), Cenchrus (pearl millet), Setaria (foxtail millet), and Hordeum (barley). Such a threshold has not previously been established for this region, or elsewhere in India, making this study a significant contribution to palaeoecological and archaeobotanical research in South Asia. In addition to size, the surface patterns on the pollen wall provided extra clues about the plant species and environmental conditions in which they grew. Thus, this comprehensive reference dataset enables the identification of fossil pollen to the species level, allowing researchers to accurately trace the emergence and development of agriculture and settlement activities over the past 10,000 years.

Pollen analysis has long been recognised as a powerful tool for detecting human influence on landscapes and agricultural development, dating back to the Neolithic period, when farming and domestication began. Anthropogenic marker pollen, especially that of cereal and non-cereal grasses, serves as a robust proxy for tracing human impact on landscapes and the development of agriculture during the current interglacial. In this study, using advanced microscopic techniques and micromorphometric analyses from the Central Ganga Plain, we establish a paired biometric threshold (pollen diameter>46 µm and annulus size>9 µm) that reliably distinguishes cultivated cereals from wild grasses. This represents the first such regionally derived threshold for the Indian subcontinent. Until now, researchers in India have largely relied on European reference thresholds to differentiate cereal and non-cereal pollen; the present study provides a context-specific alternative based on indigenous data from the Ganga Plain. Establishing a biometric threshold to distinguish cereal (cultivated) pollen from non-cereal (wild) grass pollen is essential for accurate palaeoagricultural and palaeoecological interpretations in the Ganga Plain and other regions of India. The idea of anthropogenic pollen indicators emerged from the observation that certain plants, such as cultivated crops and wild grasses, are strongly associated with human activity. Because their pollen is preserved in sediments, their presence in pollen records can reveal past agriculture, deforestation, and settlement during the Holocene (last 11,700

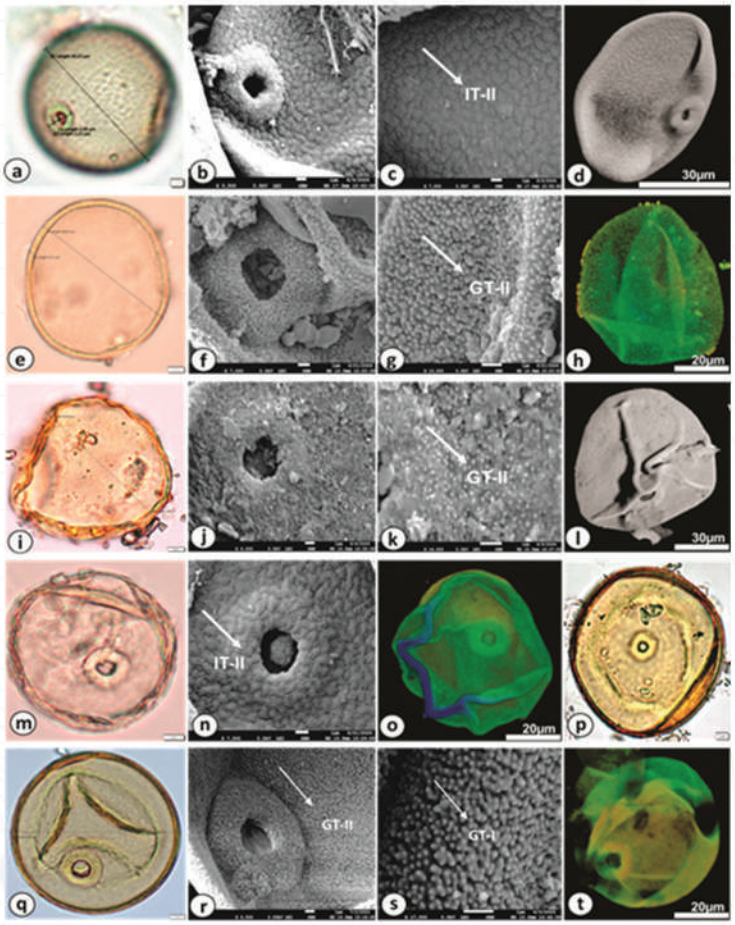


Fig. 1. Pollen micro-morphology of Cereal pollen. (a-d) Cenchrus americanus, (a) LM micrograph showing pollen grains with monoporate aperture along with annulus, (b) Enlarged view of pore and annulus (FESEM), (c) Enlarged view of sexine with Insulae Type II (IT-II) pattern formed by compact granules, forming a mosaic pattern (FESEM), (d) CLSM micrograph; (e-h) Sorghum halepense, (e) LM micrograph showing pollen grain with monoporate aperture and annulus, (f) Enlarged view of pore and annulus and granulose sexine (FESEM), (g) Enlarged view of sexine with densely arranged granules, categorized under Granulose Type-II (GT-II) pattern (FESEM), (h) CLSM micrograph; (i-l) Avena sativa: (i) LM micrograph showing pollen grain with monoporate aperture and annulus, (j) Enlarged view of pore and annulus with Granulose pattern (FESEM), (k) Enlarged view of sexine with densely arranged granules, categorized under Granulose Type-II (GT-II) pattern (FESEM), (l) CLSM micrograph; (m-o) Oryza rufipogon: (m) LM micrograph showing pollen grain with monoporate aperture and annulus, (n) Enlarged view of pore and annulus with distinct Insulae Type II (IT-II) sexine pattern near annulus formed by compact granules, forming a mosaic pattern (FESEM), (o) CLSM micrograph; (p) Zea mays, LM micrograph showing pollen grain with monoporate aperture and annulus; (q-t) Triticum aestivum, (q) LM micrograph showing pollen grains with monoporate aperture along with distinguish annulus, (r) Pollen grain with monoporate aperture and annulus around it (FESEM), (s) Enlarged view of sexine with Granulose Type I (Granules scattered, intergranular region perforated) pattern (FESEM), (t) CLSM micrograph.

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years). However, identifying ancient farming is challenging since cereal crops belong to the Poaceae (grass) family, whose pollen closely resembles that of wild grasses, making it difficult to distinguish cultivated species under a light microscope.

A total of 22 well-identified Poaceae (grass) species, including major cultivated cereals (Hordeum vulgare, Avena sativa, Oryza sativa, Oryza rufipogon, Triticum aestivum, Zea mays, Cenchrus americanus, and Sorghum halepense) and representative wild/non-cereal taxa, were analysed to generate biometric reference data. Pollen grains were extracted from floral parts using the standard acetolysis method. For each species, 40 pollen grains were examined. Primary, secondary, and tertiary pollen characters were measured using digital imaging tools. Observations were carried out under Light Microscopy (LM), Confocal Laser Scanning Microscopy (CLSM), and Field Emission Scanning Electron Microscopy (FESEM). Four multivariate statistical techniques, Detrended Correspondence Analysis (DCA), Linear Discriminant Analysis (LDA), Principal Component Analysis (PCA), and Hierarchical Cluster Analysis (HCA), were applied to assess the effectiveness of pollen morphometric parameters in distinguishing cereals from non-cereals. The study provides a robust biometric framework for improving palaeoagricultural and palaeoecological interpretations in the CGP and other regions of India. This study will significantly enhance the accuracy of research on ancient agriculture, land use, and human impact on ecosystems. It will help archaeologists and environmental historians understand how humans gradually transformed the fertile plains of the Ganga into a major agricultural hub. By analysing pollen grains, the study enables scientists to unlock the story of India's agricultural beginnings, offering a powerful window into how human societies shaped the landscape over millennia. Importantly, it provides India with its first clear, region-specific scientific tool to trace the origins of agriculture and human settlement with much greater precision.

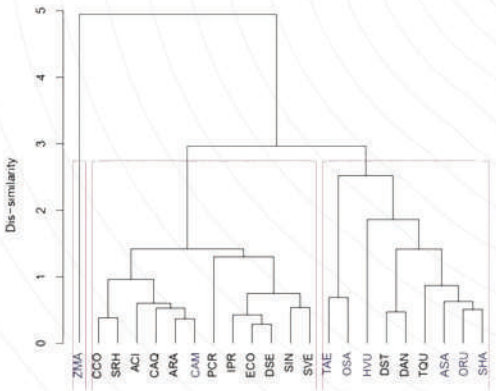


Fig. 2. Results of hierarchical cluster analysis (HCA) are shown as a dendrogram considering 22 Poaceae species. The HCA suggest three clusters with a 0.255 dissimilarity value (56.9% information remaining to be explained). ZMA: Zea mays, CAQ: Coix aquatica, ARA: Acrachne racemosa, CCO: Cymbopogon commutatus, SRH: Spodiopogon rhizophorus, CAM: Cenchrus americanus, ASA: Avena sativa, HVU: Hordeum vulgare, SHA: Sorghum halepense, TAE: Triticum aestivum, OSA: Oryza sativa, SVE: Setaria verticillata, SIN: Sacciolepis interrupta, ACI: Alloteropsis cimicina, PCR: Pogonatherum crinitum, DSE: Digitaria setigera, TQU: Themeda quadrivalvis, IPR: Iseilema prostratum, ECO: Echinochloa colona, ORU: Oryza rufipogon, DST: Dendrocalamus strictus, DAN: Dichanthium annulatum.

For more information:
Tripathi, S., Garg, A., Pandey, A., Singh, P., Singh, A., & Sharma, A. (2026). Micro-morphometry of cereal and non-cereal pollen using LM, CLSM, and FESEM: Implications for past anthropogenic activities in the Central Ganga Plain, India. The Holocene. https://doi.org/10.1177/09596836251414010.

Decoding ~3300 years of Ecological History of Kaziranga National Park, Northeast India with special reference to the migration of One-horn Rhinoceros

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A new microfossil study based on pollen and fungal spores from swamp sediments reveals how the vegetation of Assam's Kaziranga National Park (KNP) evolved over the last ~3300 years into a prime habitat for the Indian one-horned rhinoceros. Conducted by scientists from the Birbal Sahni Institute of Palaeosciences (BSIP), Lucknow, in collaboration with national and international institutions, this research provides the first long-term palaeoecological record linking vegetation history with palaeoherbivory from KNP. The findings, published in the reputable journal Catena (Elsevier), demonstrate that climate change, vegetation shifts, exotic species invasions, and herbivore activity collectively shaped the park's ecosystem over time.

Kaziranga's present landscape differs markedly from its past. Around ~3300 years BP, the region was dominated by dense tropical evergreen forests with limited grasslands and low herbivore presence. From ~1700 years BP onward, evergreen forests gradually declined while deciduous vegetation and grasslands expanded, accompanied by increasing herbivore activity. After ~640 years BP, the landscape became largely open and expanded grassland with enhanced deciduous elements, supporting a substantial rise in grazing animals. These long-term vegetation and climate dynamics played a crucial role in transforming Kaziranga into a stable and suitable habitat for megaherbivores.

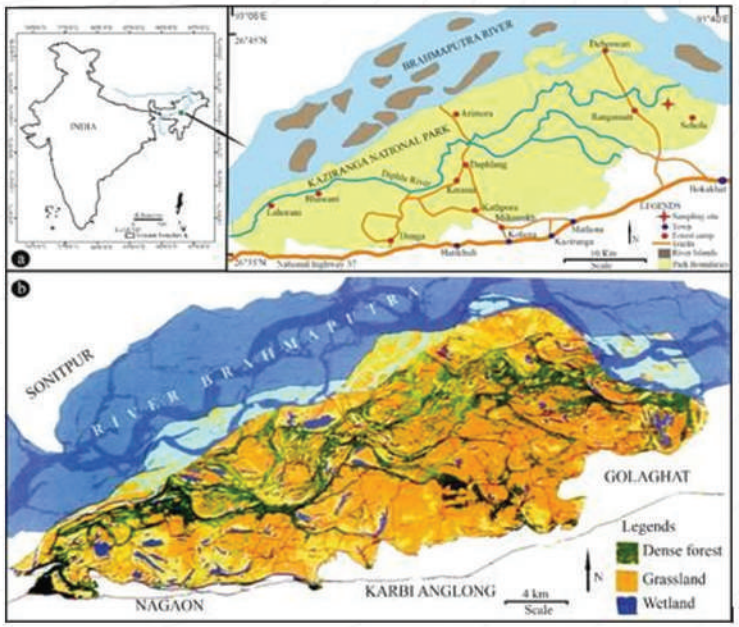


Fig. 1. a. Location map of the sampling site, b. Vegetation coverage map of the Kaziranga National Park (after Das et al., 2014).

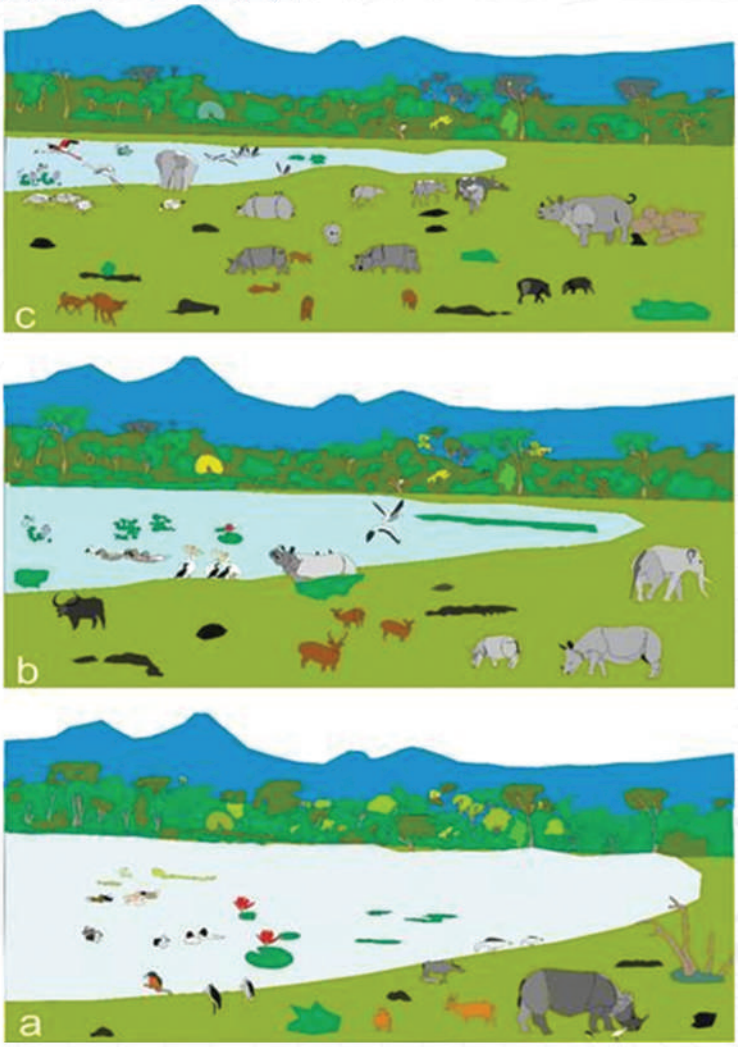


Fig. 2. Model (schematic view) of palaeovegetation and palaeoherbivory activities in the KNP. a. Dense forest with wider and swamp conditions with low wildlife activities, b. Relatively less dense and less deep water with increased wildlife activities, c. Comparatively, more or less dense forest and less deep swamp with increased wildlife activities within KNP.

The presence of invasive species, such as Mimosa (since 640 cal. yrs. BP), is increasingly degrading open grasslands, potentially affecting megaherbivore habitats in Kaziranga by replacing native floodplain grasses that constitute the primary food source for rhinoceroses. Mimosa forms dense, thorny thickets that suppress the growth of palatable grasses, thereby reducing forage availability and habitat accessibility for rhinos and other large herbivores. Moreover, these invasions alter the natural grassland–wetland structure of the floodplain, hinder animal movement, and ultimately reduce habitat quality and carrying capacity. The study also examines the historical decline and current confinement of megaherbivores, particularly the Indian one-horned rhinoceros, to northeastern India. Fossil evidence indicates that this species was once widely distributed across the Indian subcontinent. However, during the late Holocene, especially during the Little Ice Age (when the monsoon weakened), climatic fluctuations combined with increasing human activities, habitat loss, and overhunting led to regional extinction in northwestern India. In contrast, northeastern India remained relatively climatically stable and experienced lower anthropogenic pressure, facilitating the eastward migration and eventual concentration of rhinoceroses in Kaziranga, now a UNESCO World Heritage Site and their global stronghold. Microfossils preserved in sediments serve as reliable proxies for reconstructing past ecological changes. Pollen grains reflect shifts in plant composition, while coprophilous (dung-loving) fungal spores indicate the



Fig. 3 The Indian one-horned rhinoceros (Rhinoceros unicornis) feeding on grasses and drinking water in the grassland-wetland habitat of Kaziranga National Park.

presence and intensity of herbivory. Variations in their abundance and distribution were used to interpret vegetation dynamics and megaherbivore activity over time. A 110 cm sediment core collected from the Sohola swamp in the core area of Kaziranga National Park served as the basis for the study. Samples were processed using the standard acetolysis method, and radiocarbon (^{14}C) dating established a robust chronological framework. Stratigraphically constrained cluster analysis (CONISS), integrated with radiocarbon ages, identified three distinct phases of vegetation change and herbivore activity during the last ~3300 years.

The research holds broader ecological and conservation significance. Late Quaternary megafaunal extinctions remain a global concern, with nearly 60% of large herbivores worldwide currently threatened; Southeast Asia hosts the highest number of at-risk species. Northeast India, part of the Indo-Burma biodiversity hotspot, supports numerous endangered species but faces increasing pressure from urbanisation, deforestation, and natural hazards such as floods and earthquakes. By reconstructing long-term vegetation, climate variability, and wildlife responses, this study provides critical baseline data for conservation planning. The findings emphasise the interconnectedness of vegetation, climate, and megafaunal survival. They demonstrate how long-term ecological processes influenced wildlife migration, survival, and regional extinction patterns. Although conservation initiatives in Kaziranga have successfully increased herbivore populations, careful scientific management is essential to prevent habitat stress from overpopulation. The long-term ecological perspective provided by this study can guide sustainable forest and wildlife management strategies in response to ongoing and future climate change.

For more information: Basumatary, S. K., van Asperen, E. N., Vaish, S., Tripathi, S, McDonald, H. G., Gogoi, R., & Arya, A. K. (2026). Palaeoecological and palaeoherbivory dynamics in Kaziranga National Park: Late Holocene vegetation shifts and large mammal biogeography. CATENA, 263, 109762. https://doi.org/10.1016/j.catena.2025.109762.

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Application of a post-violet IR single-aliquot regenerative-dose (pVIR-SAR) protocol for natural polymineral fine and coarse-grain samples

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[e] Institute of Marine Sciences, Shantou University, Shantou-515063, China

This study presents and evaluates a post-violet infrared single-aliquot regenerative-dose (pVIR-SAR) protocol designed for luminescence dating of natural polymineral sediments. Conventional luminescence dating typically requires mineral separation, most commonly isolating quartz or feldspar from sediments. However, such separation can be difficult when the sample material is limited or when the grains are extremely fine. To address this Challenge, the pVIR-SAR protocol enables direct dating of polymineral samples by selectively targeting the feldspar luminescence signal within mixed mineral assemblages. The performance of the pVIR-SAR protocol was tested on both fine-grain (4-11 μm) and coarse-grain (90-150 μm) polymineral fractions. Standard luminescence reliability tests, including dose recovery and recycling ratio assessments, were applied to evaluate the robustness of the procedure. Dose recovery results show that the protocol accurately reproduces given laboratory doses, demonstrating good reproducibility and reliability. The equivalent doses obtained from polymineral samples were consistent with expected doses, indicating that the method can provide reliable age estimates.

The study also investigates the bleachability of different grain sizes, an important issue for feldspar luminescence signals in fluvial sediments. Results indicate that fine-grain fractions provide more reliable pVIR-SAR ages than coarse grains in fluvial samples used in the study. This is particularly relevant for sediments from regions such as the Himalaya, where quartz luminescence sensitivity is often low and coarse-grain feldspars commonly show inadequate bleaching in conventional measurements. Overall, the results demonstrate that the pVIR-SAR protocol is a promising approach for luminescence dating when conventional mineral separation is difficult. By allowing direct dating of polymineral sediments, the method expands the applicability of luminescence dating, especially for Quaternary deposits with limited sample material or complex grain compositions.

For more information:

Devi M, Singhal M, Khanduri P, Chauhan N, Singhvi AK. Application of a post-violet IR single-aliquot regenerative-dose (pVIR-SAR) protocol for natural polymineral fine and coarse-grain samples. Quaternary Research. https://doi.org/10.1017/qua.2025.10057

Karewa Palaeolake Sediments: Insights into Himalayan Tectonics and Late Quaternary Climate Variability

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The Kashmir Valley, situated within the northwestern Himalayas, preserves an exceptional geological archive in the form of Karewa palaeolake sediments. Deposited within an intermontane basin bounded by the Greater Himalayas and the Pir Panjal range, these sediments provide valuable insights into the interplay of tectonics, sedimentation, and climate over both long and short timescales. By integrating mineral magnetic, sedimentological, and geochemical approaches, this study reconstructs basin evolution during the Plio-Pleistocene and Late Quaternary climate variability. The Karewa Basin represents a tectonically active setting, where sedimentation patterns are strongly influenced by structural controls and landscape evolution. Mineral magnetic analyses of sediments from two stratigraphic formations (Dubjan and Pampore) reveal significant changes in sediment provenance and depositional dynamics. The results indicate an early phase characterized by mixed sediment contributions from both the Greater Himalayas and the Pir Panjal range. Over time, however, sediment supply became increasingly dominated by the Pir Panjal, suggesting a reorganization of basin slope gradients and palaeoflow pathways. These findings highlight the role of tectonic forcing in controlling sediment routing systems and basin-scale depositional processes in mountainous terrains.

In addition to long-term geological evolution, the Karewa sediments also preserve a high-resolution record of climatic variability spanning the last ~42 ka. A multi-proxy approach was employed, incorporating mineral magnetic parameters, particle-size distribution determined by End Member Analysis, total organic carbon content, and stable-isotopic signatures ($\delta^{13}C$ and $\delta^{18}O$) derived from both bulk sediments and ostracod shells. Robust chronological control was established using luminescence and AMS radiocarbon dating, enabling the identification of centennial-scale climate fluctuations. The reconstructed palaeoclimate record reveals a dynamic alternation between the influence of the mid-latitude Westerlies and the Indian Summer Monsoon. Thirteen distinct climatic zones were identified, reflecting shifts between colder, Westerlies-dominated phases and relatively warmer intervals associated with enhanced monsoon activity. Westerly-dominated conditions prevailed during intervals such as ~40.6–38.2 ka, 34–29.4 ka, and 24–16.5 ka, whereas a stronger monsoon influence is recorded during intervening periods.

These regional climatic oscillations show strong correspondence with major global climate events, including Heinrich events, the Last Glacial Maximum, and the Younger Dryas. Cold phases align with Marine Isotope Stage 2 and stadial conditions, while warmer phases correspond to interstadial periods and early Holocene climatic optima. The observed patterns suggest that climate variability in the Kashmir Valley was influenced not only by regional atmospheric circulation but also by global-scale processes, including changes in solar insolation and ocean–atmosphere interactions, such as fluctuations in the Atlantic Meridional Overturning Circulation. Notably, intensified Westerlies are associated with weakened phases of ocean circulation. Palaeoenvironmental conditions are further constrained through isotopic evidence. $\delta^{13}C$ values of organic matter indicate the persistence of C_3 vegetation, particularly during colder intervals, while isotopic signatures from ostracod shells reflect variations in lake water balance governed by temperature, precipitation, and evaporation.

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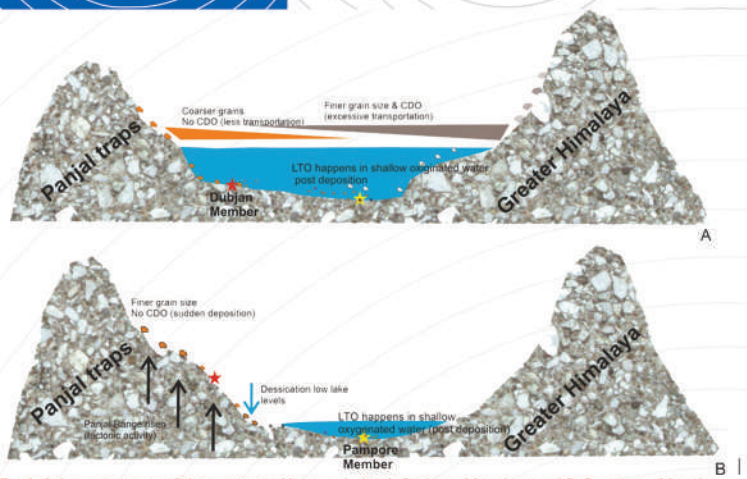


Fig 1. Schematic view of deposition in Karewa Lake, A. Dubjan Member and B. Pampore Member.

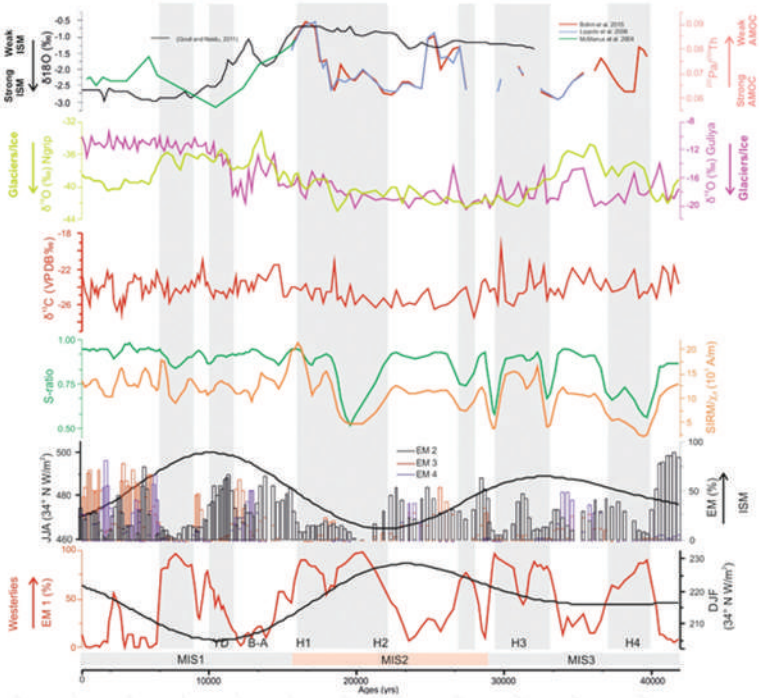


Fig. 2. Comparative multi-proxy synthesis of the Parigam record with regional and global dataset includes EM1–EM4 abundances, S-ratio, SIRM/χlf, and $\delta^{13}C$ values plotted alongside 34°N summer insolation (Laskar et al., 2004), NGRIP $\delta^{18}O$, Guliya ice core records, $\delta^{18}O$ of Globigerinoides ruber from the Bay of Bengal (Govil and Naidu, 2011), and Atlantic Meridional Overturning Circulation (AMOC) strength indicators from $^{231}Pa/^{230}Th$ ratios (McManus et al., 2004; Lippold et al., 2006; Böhm et al., 2015).

These proxies collectively demonstrate the regional ecosystem's sensitivity to climatic shifts. In summary, the Karewa palaeolake sediments provide a comprehensive record of both tectonic evolution and Late Quaternary climate variability in the northwestern Himalayas. This integrated study underscores the importance of multi-proxy approaches in deciphering complex Earth system interactions and contributes to a broader understanding of how mountain environments respond to coupled tectonic and climatic forcing.

For more information:

Verma, S., Phartiyal, B., Agrawal, S., Morthekai, P., Manoj, M.C., Chandra, R., Sahu, L.N., Sagwal, S., Kumar, P., Maurya, A.S., 2026. Coupled role of Westerlies and Indian Summer Monsoon in the climatic variability of Kashmir Valley, NW India, in the Late Quaternary. Palaeogeography, Palaeoclimatology, Palaeoecology 689, 11367. https://doi.org/10.1016/j.palaeo.2026.113670

From Forested Landscapes to Fragile Floodplains: Four Millennia of Environmental Change on Majuli Island, northeast India

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Majuli Island, recognized as the world's largest river island and one of the most erosion-prone landscapes in Northeast India, holds significant cultural, regional, and geographical importance. Formed by the dynamic fluvial processes of the Brahmaputra River, the island once represented a distinctive and ecologically rich riverine landscape. In recent decades, however, it has been undergoing progressive environmental degradation. Persistent channel migration and intensified fluvial dynamics have accelerated bank erosion, leading to a continuous reduction in the island's land area. This rapid erosion is reshaping the landscape, degrading fertile alluvial soils, and exerting increasing pressure on local ecosystems, thereby affecting faunal habitats and altering the composition and distribution of floral communities. These environmental stresses threaten the island's ecological resilience and may lead to long-term changes in vegetation structure and biodiversity. To better understand these changes, it is essential to reconstruct the island's past ecological and climatic history. Therefore, the present study aims to reconstruct the palaeovegetation and palaeoclimate history of Majuli Island in order to understand the long-term vegetation-climate dynamics of this fragile landscape.

Palaeoclimate-vegetation Interactions and Fluvial Instability on Majuli Island: *This study presents the first palaeoecological reconstruction from Majuli Island, aiming to understand long-term vegetation-climate dynamics and the role of natural and anthropogenic processes in shaping this fragile landscape. Although earlier investigations in the region focused mainly on geomorphology, geochemistry, and petroleum-related aspects, a comprehensive palaeoclimate and vegetation reconstruction has been lacking. To address this gap, we reconstruct ~4000 years of environmental history using integrated biotic (pollen) and abiotic (grain-size) proxies from a 150 cm sediment profile collected from the endangered wetland. Located within the Indo-Burma biodiversity hotspot and strongly influenced by the Indian Summer Monsoon (ISM), the region provides a sensitive archive of environmental change. Pollen analysis, supported by 25 modern surface samples and the Coexistence Approach (CA), enabled reconstruction of Mean Annual Temperature (MAT) and Mean Annual Precipitation (MAP). Results indicate warm, humid conditions with dense forests during 4040–2260 cal. yrs. BP, followed by fluctuating monsoon intensity and flood regimes, including a relatively moist phase during the Medieval Climatic Anomaly (MCA). The last ~500 years show declining MAT and MAP, consistent with Little Ice Age (LIA) cooling, accompanied by increased anthropogenic indicators and savanna-like vegetation. Grain-size data further reveal a shift toward higher-energy fluvial conditions, suggesting increasing hydrodynamic instability over time.*

Depositional Dynamics of the Sakali Wetland during the Last ~4000 cal. yrs. BP: *Wetland systems of the upper Brahmaputra Valley remain poorly explored with respect to their sedimentological characteristics and palaeoclimate significance, with only a few previous*

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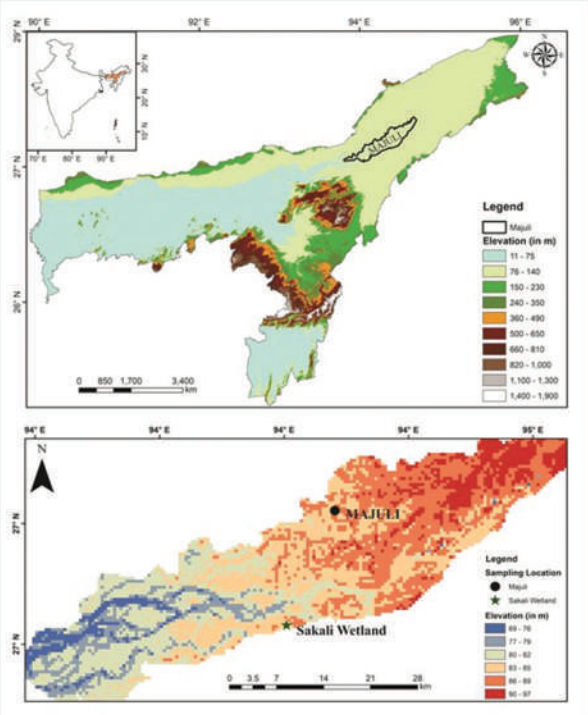


Fig. 1. Location Map showing study areas.

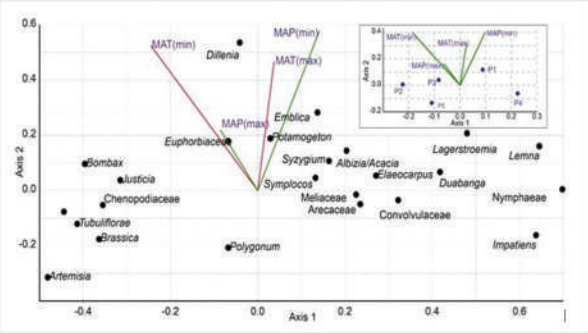


Fig. 2. Canonical Triplot illustrates the correlation between pollen abundance, respective phases (inset), and climate tolerance.

investigations (e.g., Gogoi et al., 2017). The present study provides the first systematic grain-size analysis of a mid- to late Holocene sediment core recovered from the Sakali Wetland. The grain-size distributions are predominantly unimodal, with occasional bimodal patterns, exhibiting major peaks around ~1.0Φ (coarse sand) and ~5.0Φ (silt to very fine sand). Such distributions indicate low- to moderate-energy depositional conditions within the wetland environment. The sediments exhibit very poor sorting and low kurtosis, suggesting episodic fluvial inputs and limited sediment reworking, a condition typically associated with overbank flood deposition. Skewness values ranging from −0.5 to +0.5 further indicate alternating depositional regimes: negative skewness reflecting erosional phases linked to high-energy flood events, whereas positive skewness corresponds to the accumulation of fine-grained sediments under relatively low-energy flow conditions. These sedimentological characteristics correspond well with late Holocene monsoon variability, including major climatic phases such as the 4.2 ka event, MCA, and the LIA. Collectively, the results highlight a highly dynamic depositional environment in the Sakali Wetland, shaped by fluctuating monsoonal hydrology and recurrent flood episodes over the past ~4000 years.

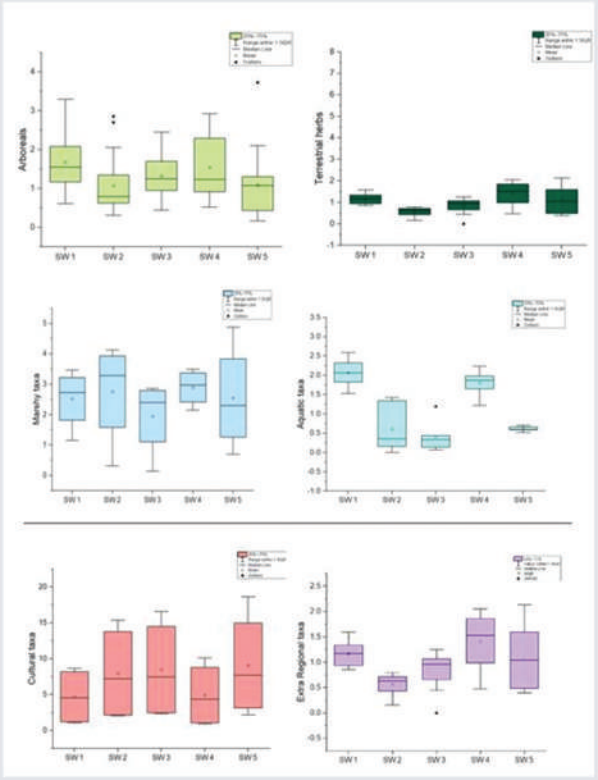


Fig. 3. Box plots showing the distribution of arboreals, terrestrial herbs, marshy, aquatic, and extra-regional taxa in the sedimentary section of Sakali Wetland, Majuli Island, based on the fossil pollen frequencies.

Overall, the study identifies signals of major Late Holocene climatic events, including the MCA, RWP, and LIA, within the sediment profile. However, the absence of a clear signal corresponding to the globally recognized 4.2 ka event suggests a relative resilience of Majuli Island to this climatic perturbation, likely maintained by persistently humid conditions regulated by the Indian Summer Monsoon. This highlights the dominant role of monsoon-driven hydrological regimes in buffering regional ecosystems against short-lived global climatic anomalies. Grain-size analysis further indicates phases of intensified rainfall and enhanced stream flow, resulting in predominantly fine-grained yet texturally heterogeneous sediments, consistent with increased monsoonal activity during the MCA. Two distinct warm-moist and cold-dry intervals corresponding to the MCA and LIA, respectively, underline the sensitivity of the Eastern Himalayan and foothill regions to broader Northern Hemisphere climatic fluctuations. The dominance of medium sand fractions in the upper layers reflects sustained high-energy depositional conditions, likely linked to intensified hydrological activity during the late LIA and early modern period. These findings emphasize the need for high-resolution multiproxy palaeoclimate studies across Majuli Island and underscore the urgency of conserving its primary forest ecosystems.

For more information:

Pandey, A., Tripathi, S., Basumatary, S.K., Khan, S., Singh, H., Thakur, B, & Sharma, A. 2026. Hydroclimatic variability and vegetation response over the last four millennia: Multiproxy records from Majuli Island, Northeast India. Review of Palaeobotany and Palynology, Volume 348, 1-21.105536, ISSN 0034-6667. https://doi.org/10.1016/j.revpalbo.2026.105536

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Holocene sea–level changes and fluvial controls on the geomorphic evolution of the Thalassery river mouth, southwest Kerala coast, India.

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This study explores how the coastal landscape near the Thalassery river mouth in northern Kerala has changed over the last ~8000 years. By analysing a sediment core collected from a wetland near the coast, the research reconstructs how sea level, river activity, and monsoon climate together shaped the region. The sediment analysis shows that the area has changed significantly. Around 8000 years ago, the region was influenced by both river and marine conditions. Coarse sediments and marine fossils indicate a shallow coastal setting where tides and river flow interacted. This period also reflects a weaker monsoon and lower sea level. Between about 7600 and 6000 years ago, there was a major shift. Stronger monsoon rains increased river discharge, bringing more sediment and organic matter into the area. At the same time, rising sea levels allowed greater marine influence. This phase broadly corresponds to the warm, humid Holocene Climate Optimum. After ~6000 years, the environment gradually became calmer. Fine sediments began to dominate, indicating lower energy conditions. The area evolved into a lagoon-like setting with reduced connection to the open sea. Over time, both marine influence and river input decreased. Over the last ~3000 years, the system has become increasingly isolated. The lagoon turned into a stagnant water body with minimal external input, eventually leading to the formation of the present-day wetland environment. Overall, the study highlights that coastal evolution in Kerala is controlled by a combination of monsoon variability, river processes, and sea-level changes. These findings improve our understanding of how tropical coastal systems respond to long-term climate change and provide useful insights for future coastal management.

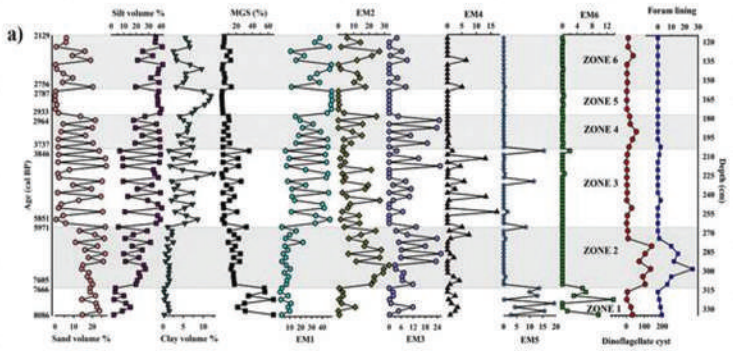


Fig. a) Downcore variations of sand, silt, clay (%), mean grain size (MGS), end members (EM1–EM6), dinoflagellate cysts, and foraminiferal linings; grey and white bars denote climatic zones.

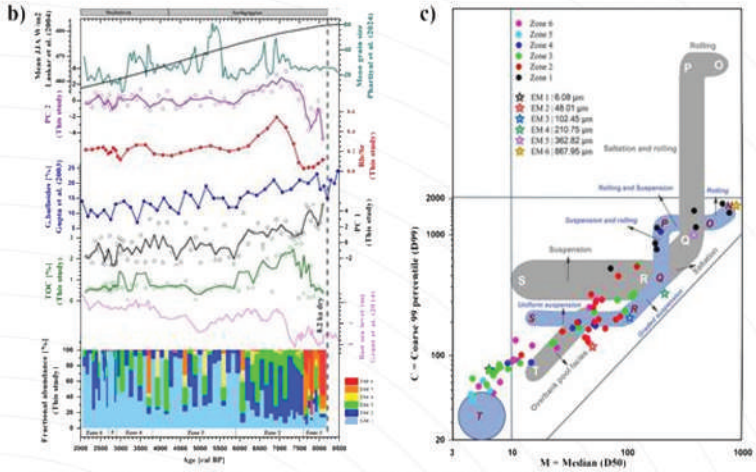


Fig. b) Correlation of DM core proxies (EM, PC, TOC%, Rb/Sr) with Red Sea level, Arabian Sea δ ^{18}O, Kanwar MGS, and 20°N JJA insolation; the 8.2 ka event is indicated. C) C–M diagram of DM sediments; light-blue fields show Passega (1964) mechanisms, and dark-grey fields show modified fields after Mycielska-Dowgiallo and Ludwikowska-Kedzia (2011).

For more information:

Prakash, P., Kawsar, M., A.S. Yamuna, Manoj, M.C., Reghunath, R., Srivastava, J., Sathimol, A.S., Aju, C.D., Sharma, R., Kumar, P.V. 2026. Holocene Sea-Level Changes and Fluvial Controls on the Geomorphic Evolution of the Thalassery River Mouth, Southwest Kerala Coast, India. Quaternary International 764, 110207. https://doi.org/10.1016/j.quaint.2026.110207

PhD Awarded





Dr. Reshma K.V
Department of Geology
Central University of Kerala
Periye, Kasaragod-671325

Title: The fluctuations of the Indian monsoon during the late Quaternary: Evidence from Lake and marine sediments

Supervisor: Dr. Sandeep K, Associate professor
Department of Geology, Central University of Kerala
Periye, Kasaragod-671325.

Earth's climate is changing rapidly, as evidenced by rising temperatures, ocean acidification, sea-level rise, and glacier retreat. Understanding the natural changes and evolution of the current climate requires reconstructing the historical climate. Palaeoclimatology is the scientific study of past climatic conditions, using a variety of proxies. Much effort



has been made in recent years to ascertain how different systems affect the Earth's climate, particularly the monsoon.The Indian monsoon is the most prominent of the world's monsoon systems. Although the Holocene Epoch is considered relatively stable, there have been both short- and long-term fluctuations in monsoonal conditions.A better understanding of the Holocene climate is important in two respects: this period is marked by the evolution and decline of human cultures, and it is well documented by abundant proxy data.A multi-proxy approach is necessary to reconcile seemingly disparate findings from continental and marine climate records and to better understand Holocene climatic variability. To understand the climate variability, environmental magnetism, particle size, Fourier Transform Infrared Spectroscopic (FTIR) technique, Diffuse reflectance spectroscopy (DRS), X-Ray Fluorescence (XRF), Inductively Coupled Plasma Optical Emission Spectroscopy (ICPOES), Accelerator Mass Spectrometry Radiocarbon Dating (AMS C 14 Dating), Carbon isotope, and Organic geochemistry.

I have studied two lakes from Karnataka and a marine core from the Bay of Bengal. Both short- and long-term climate changes over the last approximately 1600 years are shown by the high-resolution multi-proxy record from Cheppandikere Lake in the Western Ghats of southwest India. The CK record indicates a dry, weak monsoon in the region during the 350-1150 A.D. period (Phase 1) and a wet, strengthening monsoon from 1150 A.D. to the present (2022 A.D.). Ayyanakere samples in which the overall rainfall variation is identified. Phase I (1958 to 766 cal. years B.P.) was characterized by less rainfall. Phase II (~ 766 to ~ 277 cal. years B.P.) indicates an increasing trend of rainfall, and phase III (~ 277 to -69 cal. years B.P) shows a general pattern of declining rainfall. The SK core monsoon variation was inferred, 23,000 and 17,000 cal. years B.P., suggesting the winter monsoon's intensification. The monsoon was consistent during the 17000–10,000 cal. years B.P, the strong monsoonal conditions are documented during 10000-7200 cal. years B.P. corresponding to the Early Holocene Climatic Optima, which was followed by a decline and a weaker phase of the monsoon.



Dr. Sreya Sengupta
Present Address: Post-Doctoral Fellow, Just Transition Research Centre, Indian Institute of Technology Kanpur, India

Thesis Title:
Paleoclimatic reconstruction in northern India since the Middle Holocene based on multiproxy lake records

Supervisor: Prof. Anil Kumar Gupta, Department of Geology and Geophysics, Indian Institute of Technology Kharagpur, India.

Northern India has two distinct physiographic regions, viz, the Central Ganga Basin (CGB) and the northwest (NW) Himalaya. CGB receives the majority of rainfall from the Indian Summer Monsoon (ISM) from June to September, while the NW Himalaya receives precipitation from ISM as well as westerlies during the winter. The global proxy records have shown the impact of the Middle to Late Holocene climate events, such as the Holocene Climate Optimum (HCO), the 4.2 ka arid event, neoglacial period, Dark Age Cold Period (DACP), Roman Warm Period (RWP), Medieval Climate Anomaly (MCA) and Little Ice Age (LIA), and Current Warm Period (CWP) order to assess the impact of these climatic changes on paleomonsoon variability since the Middle Holocene, we studied multi-proxy records from two lakes, Chandrika Devi Lake (Lucknow district, Uttar Pradesh) and Tikkar Taal Lake (Panchkula district, Haryana) for past ~6000 years and ~700 years respectively. Chronological control was established using Accelerator Mass Spectrometry (AMS) 14 C dating and Optically Stimulated Luminescence (OSL) Dating.

The Chandrika Devi Lake is an abandoned paleochannel located near the Gomti River. Multi-proxy analysis, including grain size, XRF, Total Organic Carbon (TOC wt%), identification and characterisation of n-alkanes, stable isotope of soil organic matter (delta13C), and n-alkanes (delta13C and deltaD), provides insights into the lake formation, evolution, ISM variability, and vegetation dynamics in the lake catchment. The Lake formation began from the Gomti River at ~4100 cal yr BP under the influence of the 4.2 ka arid event. A completely closed lake formation took place at ~3000 cal yr BP. After 3000 cal yr BP, ISM variability influenced the lake dynamics.

The Tikkar Taal Lake is a closed lake in the NW Himalaya. Paleoclimatic reconstruction of the past ~700 years through multi-proxy analysis of grain size, XRF, TOC, and stable isotope of soil organic matter (delta13C) along with advanced statistical analyses like End Member Modelling (EMM), spectral analysis, Continuous Wavelet Transform (CWT) analysis, and Wavelet Transform Coherence (WTC) analysis reveals two major climate cycles, LIA and CWP. Early LIA (~1300-1500 CE) is a moderately warm period, while later LIA (~1500-1850 CE) is an arid period, with peak aridity during the Maunder Minimum (~1630-1710 CE). This precipitation disparity is caused by the influence of global teleconnections like El Niño Southern Oscillation (ENSO), North Atlantic Oscillation (NAO), and Pacific Decadal Oscillation (PDO).

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Building a Global Network for Early Career Paleoscientists

The Vision and Community of Paleo ECR India

The paleoscience community has grown significantly in recent decades, with early career researchers (ECRs) playing an increasingly important role in advancing our understanding of Earth's past. Recognising the need for a dedicated platform to connect and support these researchers, Paleo ECR India was founded on 2 October 2025. The initiative aims to bring together early-career researchers of Indian origin working in paleosciences worldwide and to promote collaboration, knowledge exchange, and professional development.

Paleo ECR India defines an Early Career Researcher as someone who is within 10 years of completing their highest academic degree or is under 40 years old. This includes PhD students, postdoctoral researchers, and early-stage faculty members working across paleoscience disciplines, including Paleoceanography, Palaeoclimatology, Paleoenvironment, Paleoecology, Palaeogeography, and Paleotectonics. The primary objective of the initiative is to create a supportive academic network where researchers can share ideas, present their work, and explore collaborative opportunities.

One of the key activities of Paleo ECR India is organising an online Talk Series in which ECRs present their research and discuss emerging scientific questions in paleosciences. In addition to the talk series, the community regularly circulates information about conferences, workshops, research opportunities, and job opportunities relevant to paleoscience researchers on national and international platforms.

The initiative is led by Dr. Arvind Shukla (Postdoctoral Fellow, The Hebrew University of Jerusalem, Israel) as the Founding President of Paleo ECR India. The community follows a collaborative structure that includes seven Core Founding Members, who serve in an advisory role and guide the initiative's development, and a 12-member Working Member team of ECRs who support the day-to-day functioning of the community.

The working team helps organise the talk series, coordinates with speakers, manages communication platforms, and supports outreach activities, ensuring that responsibilities are shared among motivated early-career researchers. Paleo ECR India also maintains an active presence across several digital platforms to strengthen communication and engagement within the community. A WhatsApp group with more than 500 ERCs serves as a dynamic space where members share information about conferences, workshops, job and research opportunities, and collaborations. The community is also active on LinkedIn and Instagram, where updates about seminars, research highlights, and community activities are regularly posted. In addition, the community runs a YouTube channel where recordings of the Saturday Talk Series and other academic discussions are uploaded, allowing wider access to these talks. By bringing early career researchers together, Paleo ECR India is helping build a vibrant global community dedicated to understanding Earth's past and shaping future paleoscience research.

Reach us at
paleoecrindia2025@gmail.com



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OBITUARY



Dr. Subhash Bhandari (1974–2026)

I write this obituary with profound grief and a deep sense of personal loss on the sudden and untimely demise of my colleague and close associate, Dr. Subhash Bhandari, who passed away due to a severe heart stroke on 15 January 2026, at the young age of 51 years. Dr. Subhash Bhandari and I have worked together since 2008, from the very inception of the Department of Earth and Environmental Science, Krantiguru Shyamji Krishna Verma Kachchh University. We were among the pioneers who jointly laid the academic and research foundation of the Department. Over the years, through collective effort, shared vision, and sustained commitment, we worked to uplift and shape the Department to its present level. His contribution to this journey was immense and irreplaceable. Academically, Dr. Bhandari was an ardent and sincere researcher with notable contributions to palaeoclimate and neotectonic studies, particularly in the Narmada Basin. He was also a visionary scientist who initiated pioneering work on Martian geomorphology and planetary analogue sites in Kachchh, supported by ISRO–RESPOND project grants. This innovative work resulted in several international research publications and the successful supervision of a Ph.D. scholar, Dr. Anil Chavan, who later pursued focused research on Mars.

In addition to his core discipline, Dr. Bhandari was entrusted with heading the Department of Archaeology at the University. He fulfilled this role with remarkable enthusiasm and dedication, actively collaborating with the Department of Archaeology, University of Kerala, and playing a key role in excavations and investigations of Harappan Civilization sites in Kachchh. His interdisciplinary approach significantly strengthened archaeological research in the region. After I assumed charge as Director of the Birbal Sahni Institute of Palaeosciences, Lucknow, Dr. Bhandari took on additional responsibilities as Head of the Department of Geosciences and later as Dean, Faculty of Science. In these leadership roles, he served the University with sincerity and distinction, contributing actively to several academic and administrative committees and supporting the University administration with commitment and integrity. Throughout this period, his colleague, Dr. Gaurav Chauhan, provided constant support in ensuring the Department's efficient functioning. The earlier faculty members of the Department of Earth and Environmental Science, Dr. Mrugesh Trivedi and Dr. Seema Sharma, along with laboratory staff, Smt. Vimala Maheshwari, Mr. Paresh Katua, and other supporting staff always stood by him in strengthening the Department. I also fondly remember the affection and care shown by a former supporting staff member, Smt. Ushaben Khatri, towards Dr. Bhandari. Beyond his academic achievements, Dr. Bhandari was a generous, approachable, and compassionate human being, always ready to help anyone who approached him, irrespective of discipline or designation. His calm demeanour, humility, and sense of responsibility earned him respect and affection from colleagues, students, and staff alike. Dr. Subhash Bhandari completed his graduation from MG Science Institute, Ahmedabad, and his PG and doctoral studies from The Maharaja Sayajirao University of Baroda, under the guidance of Prof. L. S. Chamyal, a mentor we both shared. He also supported many students of his alma mater, MGSci, and HOD Prof. R. D. Shah, even after coming to Kachchh.

He is survived by his wife, Dr. Jaya Bhandari, a doctorate in Chemistry, and their beloved son, Dhruv, a 9th-grader, to whom he was a devoted and loving father. His sudden passing is an irreparable loss not only to the Department and the University but also to his family, who have lost a pillar of strength.

I have lost a trusted colleague, a fellow pioneer, and a dear friend. The void created by his departure will be deeply felt for years to come. I pray that his soul rest in peace and that the Almighty grant his family the strength and courage to bear this immense loss.



With fond memories
Prof. Mahesh Thakkar, Director,
Birbal Sahni Institute of Palaeosciences, Lucknow
(Formerly, Head - Department of Earth and Env. Science, KSKV Kachchh University, Bhuj)

Upcoming EVENTS



PUBLICATIONS

2026

Banerji, U. S., Dubey, C. P., Pandey, L., Quamar, M. F., & Joshi, K. B. (2026). Late Quaternary climate reconstruction using multiproxy approach and mathematical techniques. Quaternary International, 757, 110097. https://doi.org/10.1016/j.quaint.2025.110097

Choudhary, D., Gilbert, C. C., Campisano, C. J., Peppe, D. J., Arif, M., Singh, S. P., ... & Patnaik, R. (2026). Geochronological insights of middle Miocene primates and vertebrate fauna of Ramnagar (J&K, India): Integrating litho-and magnetostratigraphy. PLoS One, 21(2), e0343500. https://doi.org/10.1371/journal.pone.0343500

Chahal, P., Gosh, R., Nag, D., Kumar, A., Ray, Y., & Srivastava, P. (2026). Rivers of Himalaya: Response to climate and tectonics variables. Palaeogeography, Palaeoclimatology, Palaeoecology, 113568. https://doi.org/10.1016/j.palaeo.2026.113568

Dasgupta, R., Das, S. K., Sengupta, S., Patel, P. P., Behera, P. K., & Mahapatra, D. (2026). Characterisation of the microbial community of a ferruginous duricrust in Eastern India and its geomorphic implications. Discover Geoscience, 4(1), 75. https://doi.org/10.1007/s44288-026-00449-x

Deeksha, Shah S.K., Mehrotra N., and Singh M. (2026). Climatic influences with special reference to soil moisture on radial growth of Teak (Tectona grandis) in northern Chhattisgarh, central India. Quaternary 9(1):1-24. https://doi.org/10.3390/quat9010008

Guérin, G., Qin, J., Tsukamoto, S., Wallinga, J., & Murray, A. (2026). The closing discussion of the Luminescence and Electron Spin Resonance Dating meeting (June 2023, Copenhagen): a review. Radiation Measurements, 107655. https://doi.org/10.1016/ j.radmeas. 2026.107655

Kumar, S., Bisht, V., Islam, R., Acharya, B., Kumar, A., Dosseto, A., ... & Srivastava, P. (2026). U-series constraints on granite weathering across climatic gradient in the Garhwal Himalaya and metagenomic insights on microbial mediation in weathering. Catena, 262, 109674. https://doi.org/10.1016/j.catena.2025.109674

Lakshmi, B.V., Deenadayalan, K., Srivastava, P., Sharma, A., & Dimri, A. P. (2026). Late Holocene flood reconstruction from the fluvial sediments in the Deccan Trap region of Central India. Quaternary International, 761, 110197. https://doi.org/10.1016/ j.quaint.2026. 110197

Lian, O. B., Spooner, N. A., Bailiff, I. K., Smith, B.W., Thomsen, K. J., & Godfrey-Smith, D. I. (2026). History of luminescence dating from an instrumentation perspective. Quaternary Research, 1-18. https://doi.org/10.1017/qua.2025.10068

Pandey, A., Tripathi, S., Samal, P., Morthekai, P., & Singh, H. (2026). Quantitative assessment of modern pollen analogue from Majuli Island, Northeast India: insights into vegetation-climate dynamics and human impact. Environmental Monitoring and Assessment, 198(3), 264. https://doi.org/10.1007/s10661-026-15101-x

Pandey A., Tripathi Swati, Basumatary SK, Khan S, Singh H, Thakur B, Sharma A. 2026. Hydroclimatic variability and vegetation response over the last four millennia: Multiproxy records from Majuli Island, Northeast India. Review of Palaeobotany and Palynology (Elsevier), 105536. https://doi.org/10.1016/j.revpalbo.2026.105536.

Prakash, P., Kawsar, M., A.S. Yamuna, Manoj, M.C., Reghunath, R., Srivastava, J., Sathimol, A.S., Aju, C.D., Sharma, R., Kumar P.V. 2026. Holocene Sea-Level Changes and Fluvial Controls on the Geomorphic Evolution of the Thalassery River Mouth, Southwest Kerala Coast, India. Quaternary International, 764, 110207. https://doi.org/10.1016/j.quaint.2026.110207

Riedesel, S., Duller, G.A., Hellers, M., Pearce, N. J., Winzar, J. A., Bell, A. M., & Kleinschrodt, R. (2026). Linking feldspar luminescence phenomena and mineralogy using spatially resolved techniques. Physics and Chemistry of Minerals, 53(2), 8. https://doi.org/10.1007/s00269-026-01345-z

Shinde, K., Mohan, K., Kumar, P., Manjunatha, B. R., Jose, J., & Saravanan, K. (2026). Reconstruction of high-resolution climate variability of the late Holocene using multi-proxy sedimentary records of the western Bay of Bengal. Palaeogeography, Palaeoclimatology, Palaeoecology, 113721. https://doi.org/10.1016/ j.palaeo.2026.113721

Tiwari Arvind, Phartiyal Binita, Manoj MC, Kawsar Masud, Prasanna K, Sharma Rajveer, Kumar Pankaj, Sharma Anupam . 2026. Palaeoenvironmental reconstruction from Hulas Khera: Insights into mid-late Holocene hydroclimatic variability in the Central Ganga Plain. Palaeogeography, Palaeoclimatology, Palaeoecology, 686,113551. https://doi.org/ 10.1016/ j.palaeo. 2026.113551.

Verma, S., Phartiyal, B., Morthekai, P., Venkateshwarlu, M., Chandra, R., & Das, P. K. (2026). Provenance and depositional processes of Plio-Pleistocene Karewa group sediments of Kashmir valley: Insights from mineral magnetism study. Quaternary International, 760, 110167. https://doi.org/10.1016/j.quaint.2026.110167

Verma, S., Phartiyal, B., Agrawal, S., Morthekai, P., Manoj, M.C., Chandra, R., Sahu, L.N., Sagwal, S., Kumar, P., Maurya, A.S., 2026. Coupled role of Westerlies and Indian Summer Monsoon in the climatic variability of Kashmir Valley, NW India, in the Late Quaternary. Palaeogeography, Palaeoclimatology, Palaeoecology 689, 11367. https://doi.org/10.1016/j.palaeo.2026.113670.

2025:

Bhattacharya, F., Chauhan, G., Sane, K., Jani, C., Bhosale, S., Lakhote, A., ... & Bhandari, S. (2025). Understanding landform evolution in dryland fluvial systems by examining relict paleochannels in the Kachchh mainland, western India. Journal of Quaternary Science. https://doi.org/10.1002/jqs.70038

Baby, S. R., Kuppusamy, M., Manjunatha, B. R., Jose, J., Kumar, P., Kothandaraman, S., & Mishra, R. (2025). Multi-paleoclimatic proxies implicate climate shift from arid-to-humid in the Northeastern Arabian Sea teleconnected to ENSO events. Palaeogeography, Palaeoclimatology, Palaeoecology, 113463.

Hire, P. S., Bramhankar, G.W., Patil, A. D., Jaiswal, M. K., Goswami, K., & Kumar, D. (2025). Changes in the magnitude and frequency of Holocene monsoon floods on the Mahi River, western India with special reference to Anthropocene. Quaternary International, 745, 109936. https://doi.org/10.1016/j.quaint.2025.109936

Raj, R., Tripathi, J. K., Das, A., Azam, M. M., Patel, A., Kumar, P., ... & Prizomwala, S. (2025). Unravelling the Holocene climate patterns in North-western India: Insights from lake sediment records. Palaeogeography, Palaeoclimatology, Palaeoecology, 113130.https://doi.org/10.1016/j.palaeo.2025.113130

Shukla, S. S., Pani, P., Mishra, M., & Sharma, R. (2025). Unlocking geomorphic complexity in fluvial behaviour: Insights from the Bakulahi River, Central Ganga Plain, India. Proceedings of the Indian National Science Academy, 1-15. https://doi.org/10.1007/ s43538-025-00506-y

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Honours/Awards/ Recognition/ Young Talent



Young Scientist Award



Dr. Pujarini Samal
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CSIR- National Botanical Research Institute, Lucknow

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For Ocean Sciences Meeting, 2026, Glasgow, Scotland



Dr. Tyson Sebastian
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Dr. Maria Fernandes
Project Scientist-I,
NCPOR, Goa



Mr. Anand Rajoriya
DST-INSPIRE SRF, BSIP
For the International Conference on Isotopes, 2026, Florence, Italy



Ms. Mitra Rajak
CSIR-UGC SRF, BSIP
For Climate and Cryosphere Open Science Conference, 2026, Wellington, New Zealand



Mr. Anand Rajoriya of BSIP, Lucknow, has won the Best Presentation (Poster) award at the 12th International Conference on Isotopes (12ICI), Florence, Italy.

Mr. Biswajit Palar of CORAL, IIT Kharagpur, won the best poster award at the 3rd Indian Quaternary Congress (IQC) held at IITM Pune, Maharashtra.





IQC Best Poster Award Winners
Ms. Adhra Renny, Ms. Anwesha Sarkar, Mr. Tanveer Rehman Warid, of BSIP Lucknow and
Mr. Biswajit Palar, IIT Kharagpur.
IQC Best Oral Presentation Award Winners
Ms. Nidhi Tomar and
Mr. Shirish Verma of BSIP, Lucknow &
Mr. Nithin Kumar, NIAS Bangalore.

Tanveer Warid Rahman, BSIP won the Best Poster Award at the 3rd Indian Quaternary Congress "Tracing Earth System Dynamics and Human-Environment Interactions through the Quaternary" at IITM Pune, Maharashtra



INSA Anniversary General Meeting & Induction Ceremony 2025:

Dr. Swati Tripathi, Scientist-E, Birbal Sahni Institute of Palaeosciences, attended the Anniversary General Meeting of the Indian National Science Academy (INSA) at Jawaharlal Nehru University (JNU), New Delhi, on 3 December 2025, for her induction and felicitation as an INSA Young Associate–2025. She attended the INSA Science Week Celebration-Delhi 2025 at Amity University, Noida, on 2 December 2025, where she delivered a lecture and participated in a round-table discussion with Fellows and Young Associates of the Indian National Science Academy, along with faculty members of the University, on the theme "Environment, Sustainable Development, and Climate Change Issues."



Quaternary Chronicles
Happenings in the Sub-continent
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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.

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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).*

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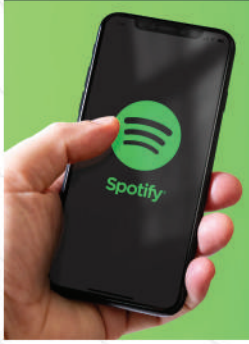
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ABOUT

Quaternary is the age when modern recognisable humans started inhabiting this planet. All over the world scientists are engaged in studying various aspects of human evolution. Once every 4 years scientists from all across the Globe gather at one place and exchange their research, discoveries and views. In 2027 Lucknow (India) has the honour of hosting this congress. Through this podcast, accompany me, Veraa on an amazing journey about human evolution, changing climate and reorganisation of environments.