

Hybrid Conference

12-13 February 2025

Chemical Weathering, Climate Change and the Global Carbon Cycle

CONFERENCE PROGRAMME



The
Geological
Society

Wednesday 12th February

08:45 – 09:00 Opening & Welcome Address

SESSION ONE: Modern chemical weathering processes and fluxes

09:00 – 09:45 Climate versus erosional controls on inorganic carbon fluxes Emily Stevenson (*Deutsche GeoForschungsZentrum GFZ*)

09:45 – 10:10 Weathering as a net source of CO² and a positive feedback in the climate system? Robert Hilton (*University of Oxford*)

10:10 – 10:35 An inorganic carbon budget for three of the largest rivers in SE Asia, the Irrawaddy, Mekong and Salween Rivers Edward Tipper (*University of Cambridge*)

10:35 – 11:15 **Coffee Break**

11:15 – 11:40 Impacts of warming and permafrost thaw on chemical weathering and riverine carbon fluxes on the Qinghai-Tibet Plateau Aaron Bufe (*Ludwig-Maximilians-Universität München*)

11:40 – 12:05 Coupled radiogenic Nd and Hf isotopes reveal South Asian Monsoon climate control of silicate weathering Ed Hathorne (*GEOMAR Helmholtz Centre for Ocean Research*)

12:05 – 12:30 Quantifying Petrogenic Carbon Oxidation in a Suite of Catchments with Variable Glacier Cover Sebastian Muñoz (*Brown University*)

12:30 – 14:00 **Lunch**

SESSION TWO: Measuring weathering intensity and reverse weathering

14:00 – 14:45 The Changing Arctic Critical Zone: tracing the influence of permafrost thaw Sophie Opfergelt (*UCLouvain*)

14:45 – 15:10 Testing the application of lithium isotopes as weathering regime tracers in Holocene Yorkshire speleothems Katie Brown (*University College London*)

15:10 – 15:35 Sr and Nd isotopes as a tracer for basalt weathering after application to fields for the purpose of carbon dioxide removal Tom Reershemius (*Newcastle University*)

15:35 – 16:15 **Coffee Break**

16:15 – 16:40 Lithium Isotopes Unveil Intensified Weathering in North America During the Paleocene-Eocene Thermal Maximum Rocio Jaimes Gutiérrez (*University of Geneva*)

16:40 – 17:05 Evaluating the drivers and interactions of chemical weathering across the Paleocene-Eocene Thermal Maximum (PETM) Matthew Staitis (*University of East Anglia*)

17:05 – 17:30 Out in the cold: The role of early diagenetic reactions in nutrient fluxes across the sediment-water interface in glaciated coastal regions Kate Hendry (*British Antarctic Survey*)

17:30 – 18:00 General Discussion

18:00 **End of Day One**

Thursday 13th February

08:45 – 09:00 Opening & Welcome

SESSION THREE: Palaeo-weathering records

09:00 – 09:45 Quantifying past chemical weathering using Li isotopes: moving beyond global seawater records David Wilson (*University College London*)

09:45 – 10:10 Evolution of silicate weathering in the Yangtze River Basin since 3.5 Ma: evidence from sediment records in the South Yellow Sea Shiming Wan (*Institute of Oceanology, Chinese Academy of Sciences*)

10:10 – 10:35 Clay mineral constraints on continental weathering and the emergence of land plants William McMahon (*University of Cambridge*)

10:35 – 11:15 **Coffee Break**

11:15 – 11:40 Soil formation and weathering over the past 60kyr using lithium isotopes from Maar records Philip Pogge von Strandmann (*JGU Mainz*)

11:40 – 12:05 Late Pleistocene island arc weathering in Southeast Asia Zhaojie Yu (*Institute of Oceanology, Chinese Academy of Sciences*)

12:05 – 12:30 The impact of chemical weathering on the Late Cretaceous climatic cooling - evidence from a chalk-derived lithium isotope record Silke Voigt (*Goethe University Frankfurt*)

12:30 – 14:00 **Lunch**

SESSION FOUR: Modelling Chemical Weathering and Climate Change

14:00 – 14:45 Competing and complementary roles of lithology, ice and land plants on chemical weathering and global carbon fluxes Daniel Ibarra (*Brown University*)

14:45 – 15:10 Assessing CO₂ and O₂ flux and enhanced rock weathering rates in mafic-ultramafic mine waste material storage facilities: Novel laboratory methods and field implementation to determine rates on the timescales of decades to centuries Rosalia Shiimi (*Mine Environment Management Ltd (MEM)*)

15:10 – 15:35 Significance of Himalayan versus New Guinea Weathering in Driving Neogene Cooling Peter Clift (*University College London*)

15:35 – 16:00 **Coffee Break**

16:00 – 16:25 Quantitative assessment of silicate weathering and carbon uptake during erosion based on sediment geochemistry. Application to the Himalayan system Christian France-Lanord (*CRPG, Université de Lorraine-CNRS*)

16:25 – 17:10 General Discussion

17:10 **End of Day One**

Poster Title	Author
Quantifying Organic Carbon Oxidation from Mountains to Floodplains Using Rhenium and its Isotopes	Victoria Alcock (<i>University of Oxford</i>)
Progress on supergene mineral dating via the $^{40}\text{Ar}/^{39}\text{Ar}$ technique and terrestrial weathering in Great Britain and Ireland	Dan Barfod (<i>University of Glasgow / SUERC</i>)
Precessional variation of monsoon-controlled silicate weathering caused steady atmospheric CO_2 consumption during glacial periods	Debo Zhao (<i>Institute of Oceanology, Chinese Academy of Sciences</i>)
Decrease CO_2 consumption from chemical weathering during warmer climates in North New Guinea	Yifan Du (<i>University College London</i>)
Chemical Weathering: Processes, Proxies, and Advances in Modeling	Divyadeep Harbola (<i>Indian Institute of Technology Bombay</i>)
Optimising Carbon Sequestration and Storage in Actively Weathered and Eroding UK Upland Silicate Landscapes Through Novel Biogeochemical Intervention and Ecosystem Restoration	Matthew Johns (<i>University of Manchester</i>)
Climate-tectonic Influence on Weathering in Himalaya: U-series isotope Insights from Granite and Metabasalt Weathering Profiles	Sohan Kumar (<i>Indian Institute of Technology Roorkee</i>)
A Role for Dynamic Topography in the Global Weathering Carbon Budget	Alex Lipp (<i>University of Oxford / University College London</i>)
Weathering Response of Eastern Australia During the Early-Mid Miocene	Becky McGanity-Smith (<i>University College London</i>)
Coupled ^{13}C - ^{14}C evidence for metamorphic CO_2 in the Himalayan-Tibetan Orogen	Samyak Pradhan (<i>Indian Institute of Technology Kanpur</i>)
Greenhouse gas release from warming rivers in the Arctic	Sabina Sulikova (<i>University of Oxford</i>)
Chemical Weathering and Sediment Transport in the Holocene and Recent Mississippi River	Bailey Wycoff (<i>Louisiana State University</i>)
Tracking seasonal differentiation between carbonate and basalt weathering in modern catchment	Jianghai Yang (<i>China University of Geosciences (Wuhan)</i>)
Enhanced weathering input from South Asia to the Indian Ocean since the late Eocene	Zehua Song (<i>Institute of Oceanology Chinese Academy of Sciences</i>)
Mineralogical control on the chemistry of the Girdiman River water	Anar Abtalibov (<i>University of York</i>)
Anthropogenic Impacts on Chemical Weathering Cycles: Bridging Geotechnical Practices and Climate Feedbacks	Ali Riza Erson (<i>Yeditepe University</i>)
Assessing Chemical Weathering Rates in Large and Coastal Rivers of India: Identifying Potential Zones for Enhanced Chemical Weathering Implementation	Reddy Kiran Kumar (<i>Centre for Marine Living Resources and Ecology</i>)

Co-convenors:

Prof Peter Clift (University College London)

Prof Philip Pogge von Strandmann (Johannes Gutenberg-Universität Mainz)

Prof Kate Hendry (British Antarctic Survey)

Dr. Anne-Catherine Pierson-Wickmann (Université de Rennes)

THANK YOU

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