

Final Circular

International Conference on Volcanism, Impacts and Mass Extinctions: Causes and Effects

Flett Lecture Theatre,
The Natural History Museum
(NHM),
London, 27-29 March 2013

Thank you for registering for this conference.

The programme has been organized to cover as many aspects of the major geological extinction events and their hypothesized causes as time allows. To accommodate as many presentations as possible we have accepted a wide range of both invited and contributed talks and posters. The programme of oral presentations and posters can be found at the end of this circular.

Logistics and Housekeeping

The conference will commence with an ice-breaker reception on the evening of 26th March from 5:00 to 7:00 pm in the foyer area outside The Natural History Museum's Flett Lecture Theatre. Delegates are asked to use the Earth Galleries Entrance to the Museum on Exhibition Road (see attached map). The Flett Lecture Theatre is located above a Mezzanine on the Second Floor of the Earth Galleries Building.

The registration desk will be open from 4:00 pm and throughout the ice-breaker reception, for delegates to collect the conference programme book and other materials. Those delegates presenting posters should put them up between 3:00 and 5:00 pm on 26th March (posters will remain on display for the duration of the conference).

For those unable to attend the ice-breaker reception, the registration desk will be open in the Foyer outside the Flett Theatre from 8:30 am on the 27th and throughout the conference.

Entry to the Museum

The Museum does not open to the public until 10:00 am. Therefore, delegates arriving for the conference, which starts at 9:00 am each day, will have to enter *via* the Earth Galleries Entrance to The Natural History Museum on Exhibition Road. These doors will be open from 8:30 am each day of the conference. Entrance will be allowed to all delegates whose names are on the master delegate list or who can show a conference name badge to NHM Security Staff at the door. Although after 10:00 am delegates may use any public entrance to the Museum, they are advised to use the Earth

Galleries Entrance on Exhibition Road and make their way to the Flett Lecture Theatre which is located above a Mezzanine on the Second Floor of the Earth Galleries Building.

Delegates should wear their conference badge at all times while attending the conference.

All delegates' bags will be inspected — and some may be subjected to routine search — by security staff upon entry. This inspection/search is a standard security procedure. We ask for the delegates' patience and understanding with this aspect of routine NHM operations.

Access for disabled delegates

If you have any special requirements in this regard you must contact Prof. Norm MacLeod in advance of the conference (n.macleod@nhm.ac.uk). The Flett Theatre is accessible to disabled persons but we will need to arrange for you to be escorted to the elevators that are located in non-obvious parts of the Earth Galleries building.

Poster presentations

Posters presentations are an important feature of this conference and dedicated poster sessions, with a cash bar, will be held on the evenings of 27 and 28 March.

All posters will remain on display throughout the duration of the conference.

Your poster should be a **maximum of size of A0 i.e., 1.18 m tall x 0.84 m wide**. Please contact Prof. Norm MacLeod if you have any queries regarding the poster displays (n.macleod@nhm.ac.uk).

Oral Presentations

Invited speakers have been allocated slots of 20 minutes' duration and contributed talks 15 minutes, **including time for questions in both cases**. There will also be time for further discussion with speakers during the evening poster sessions, either in the lecture theatre or more informally in the Flett foyer over a drink.

For oral presentations, electronic presentation files in the MS-Powerpoint, Adobe Acrobat, or Apple Keynote formats will be accepted.

All speakers should send a final copy of their presentation in one of these formats to the Local Organiser, Prof. Norm MacLeod (n.macleod@nhm.ac.uk) no later than 22 March 2013. This will allow us to solve in advance any presentation compatibility issues with the conference laptop. If you have any special requirements for your presentation (e.g. special fonts, videos) please identify these when submitting your presentation.

If the file size of your presentation is larger than 5Mb please send it to Norm MacLeod using one of the standard file transfer sites such as 'yousendit' - www.yousendit.com or 'Dropbox' - www.dropbox.com

Publication of the GSA Special Paper

An edited volume of review and original research articles based on the conference presentations will be published by the Geological Society of America as part of its Special Paper Series. GSA Special Papers have been accepted into Thomson Reuter's Book Citation Index. Citations will be counted on the book, chapter, and author levels and will become part of an author's H index score.

To ensure inclusion in this volume, completed articles should be received no later than two months after the conference (May 31, 2013). GSA expects to publish this volume by spring 2014. To meet this deadline we

must submit the reviewed/revise and finalized manuscripts for printing to GSA no later than September 2013. This date will allow authors to incorporate information gleaned from our multi-disciplinary conference. This is doable if we all hold to the deadlines outlined below and reviewers can be held to a reasonable time table of 4-6 weeks max.

Our objective is a series of review and original research papers that deal with recent advances concerning all five mass extinction events, impacts and volcanism (large igneous provinces) and integrating, as far as possible, the fields of volcanology, geophysics, geochronology, geochemistry, sedimentology, mineralogy, paleontology and astrophysics. The objective is to further a comprehensive integrative and multi-disciplinary approach that can significantly advance our understanding of major events in Earth's History.

To achieve this objective, authors are encouraged to incorporate new information and emerging data from various fields that may lead to more comprehensive or alternative scenarios than would be possible based on data from single disciplines.

Deadline for submission of manuscripts	May 31, 2013
Reviews completed	July 1, 2013
Revisions completed	August 1, 2013
Submission of final manuscripts to GSA	September 1, 2013

As you prepare your papers, please follow the GSA guidelines summarized below with more details posted at <http://www.geosociety.org/pubs/bookguid.htm>

- Manuscripts must have line numbers and should be double spaced.
- Abstracts should be restricted to no more than 250 words.
- The original text files should be in Word (Mac files are O.K.).
- Tables should be compiled in Word or Excel.
- For figures the information is extensive and is detailed on the GSA Web site (<http://www.geosociety.org/pubs/bookguid4.htm>). In brief: the following native formats work best, as long as the version of the application is noted and the file is labelled with the correct extension: Corel Draw = .cdr; Canvas = .cvs; Freehand = .fh; Illustrator = .ai; and Photoshop = .psd. If you create either .tif or .eps files, they must be between 300 (for photos) and 1200 (for line art) dpi resolution at full size. Label figure files with author name, figure number, and extension.
- GSA does print colour figures and has offered two free colour figures per chapter in this Special Paper in honour of their 125th anniversary in 2013. If you wish to include more than two colour figures then the GSA will charge a modest \$400 for the first additional page of colour in a chapter and \$100 for each subsequent page of colour in the same chapter.

Please submit completed manuscripts via email by 31 May 2013 to:

Either: Gerta Keller <gkeller@princeton.edu>

Or: Andrew Kerr KerrA@cardiff.ac.uk

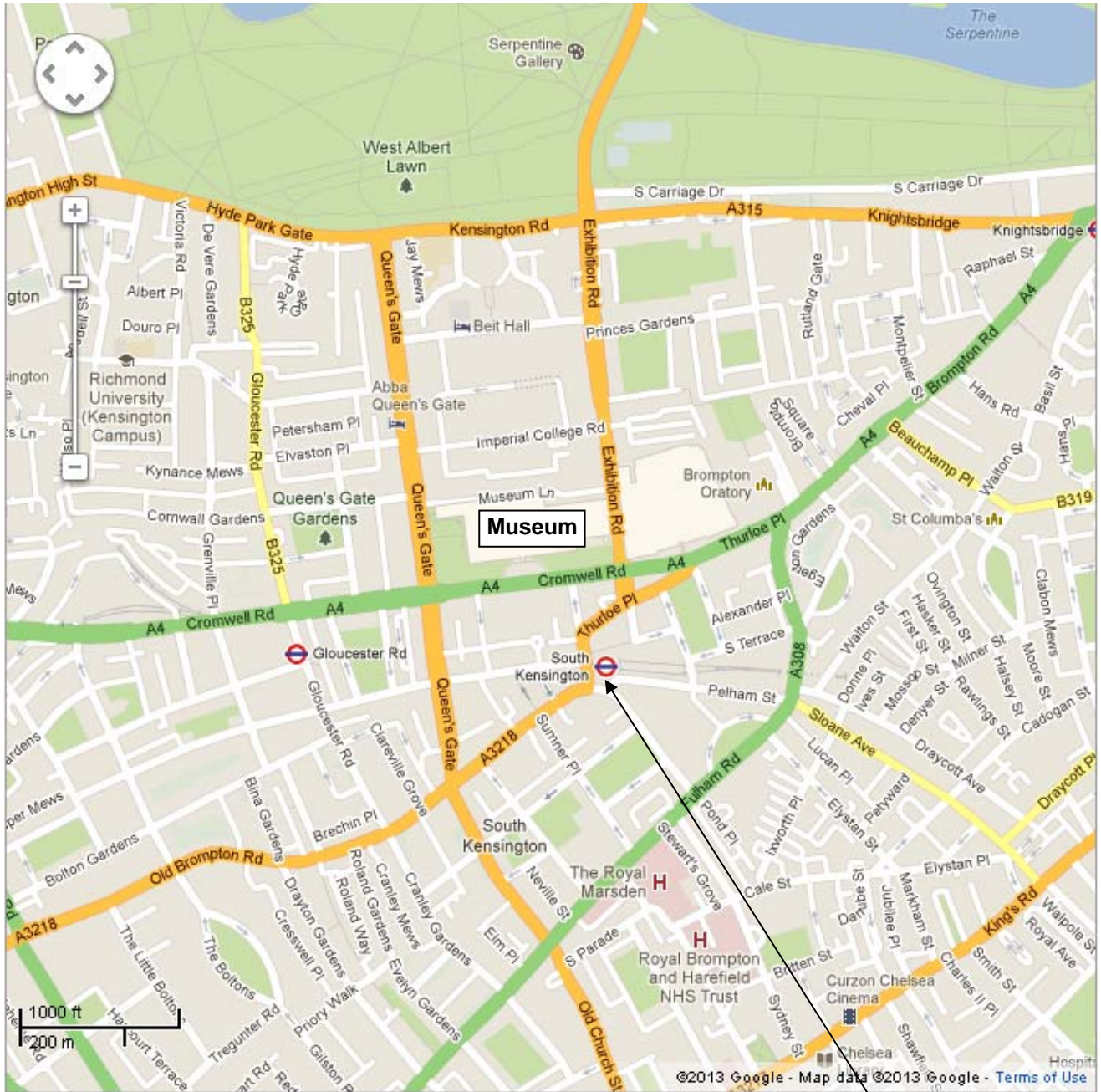
In order to facilitate sending the manuscript out to reviewers, please combine all word, image and table files into one document and submit as a single pdf file

If you have any colleagues who are considering attending the conference, but who have not yet registered, please let them know that the final registration deadline is 8th March.

We look forward to welcoming you to London and The Natural History Museum

Gerta Keller, Norm MacLeod, Andrew Kerr

Map of the area around The Natural History Museum



Nearest underground station on the Circle line

Depending on your arrival airport you can use either the Gatwick or Heathrow Express to get to central London: www.gatwickexpress.com or www.heathrowexpress.com

Bus and underground journeys within London can be planned using this site: www.tfl.gov.uk

SCHEDULE OF ORAL PRESENTATIONS

WEDNESDAY MARCH 27th

09:00 – 09:15 **Welcome**

Session I: Review of Records: Mass Extinctions, Volcanism, Impacts

09:15-09:35

Invited

The geological record of extinctions
N. MacLeod

09:35-09:55

Invited

Flood basalt volcanism is the main cause of mass extinctions: evidence and modelling
Vincent Courtillot, Frédéric Fluteau

09:55-10:15

Invited

The role of giant comets in the mass extinction of species
William M. Napier

10:15-10:35

Invited

The current status of sea-level change as a causal factor in mass extinctions
Tony Hallam

10:35-10:55

Invited

Models for the recovery of life from mass extinction
Michael J. Benton

10:55-11:15 - **Coffee/tea break**

Session II: Meteorite Impacts & Comet Showers

11:15-11:35

Invited

Implications of the centaurs, Neptune-crossers and Edgeworth-Kuiper Belt for Terrestrial catastrophism: Dwarf planets, minor planets, giant comets and dust
Duncan Steel

11:35-11:55

Invited

Revised flux of meteorite impacts on Earth; probabilities and consequences for the geological record?
Adrian P Jones

11:55-12:15

Invited

The Boltys Crater record of the K/Pg: Impact and the record of the K/Pg boundary
Simon Kelley, Dave Jolley, Iain Gilmour, Robert Daly, Mabs Gilmour

12:15-12:35

Invited

Extraterrestrial driver for 536-537 AD climate catastrophe
Dallas Abbott

12:35-14:00 - **Lunch Break** – a wide variety of restaurants, snack bars & pubs are available around the Museum.

Session III: Large Igneous Provinces (LIPS)

14:00-14:20

Invited

The tropospheric chemistry of volcanic plumes

T.A. Mather

14:20-14:40

Invited

Impact of large igneous provinces: a modelling approach

Frédéric Fluteau, Mickael Mussard, Guillaume Le Hir, Yves Balkanski, Olivier Boucher, Vincent Courtillot

14:40-14:55

Assessing the atmospheric S burden of continental flood basalts through synchrotron light micro-XRF

Sara Callegaro, Don R. Baker, Angelo De Min, Cecilia Viti, Hervé Bertrand, Fabrizio Nestola, Andrea Marzoli

14:55-15:10

Self-limiting chemistry, aerosol and climate effects of large-scale flood lava eruptions

Anja Schmidt, Thorvaldur Thordarson, Marjorie Wilson, Kenneth S. Carslaw

15:10-15:25

The role of mantle volatiles in the formation of large igneous provinces and associated mass extinction events

Sally A Gibson

15:25-15:40

Intrusive LIPs: Deep crustal magmatic processes and the dual-timescale problem for the emplacement of Large Igneous Provinces

Mark A. Richards

15:40-16:00 - **Coffee/tea break**

Session IV: Ordovician and Devonian mass extinctions

16:00-16:20

Invited

End-Ordovician mass extinction

Howard A. Armstrong, David A.T. Harper

16:20-16:40

Invited

Causes of the Late Devonian mass extinction: Extraterrestrial or Earth-bound?

Michael Joachimski

16:40-17:00

Invited

The Late Devonian (Frasnian/Famennian) mass extinction: Harbinger of the Late Palaeozoic Ice Age?

George R. McGhee Jr

17:00-17:15

Discussion of Day's Events

17:15-19:00 - **Poster session and cash bar**

THURSDAY MARCH 28

Session V: Permian-Triassic mass extinction & LIPS

09:00-09:20

Invited

The Siberian Flood Basalts: Connecting the mantle, the continental crust, and the atmosphere
Linda T. Elkins-Tanton, Benjamin Black, J.-F. Lamarque, Christine Shields, Jeffrey Kiehl

09:20-09:40

Invited

Death by Fire: The volcanism/extinction link in the Middle and End Permian
Paul B. Wignall, David P.G. Bond

09:40-09:55

Plant life in the Siberian Large Igneous Province
Henk Visscher, Cindy V. Looy

09:55-10:10

Latitudinal bias to extinction risk? Middle and end-Permian extinctions were severe and rapid in the Boreal Realm
David P.G. Bond, Paul B. Wignall, Yadong Sun, Dierk Blomeier

10:010-10:25

Greenhouse effect of large igneous provinces: SIMS oxygen isotopes of conodonts from the Meishan and Penglaitan sections in South China
Yi-Gang Xu, Jun Chen, Shu-Zhong Shen, Bin He, Xian-Hua Li

10:25-10:40

Severe climatic warming during the end-Permian
Martin Schobben, Michael Joachimski, Christoph Korte, Dieter Korn, Lucyna Leda

10:40-11:00 - **Coffee/tea break**

11:00-11:15

Understanding environmental impacts of Siberian Traps and Ontong Java Plateau: insight from geodynamic modeling
Stephan V. Sobolev, Alexander V. Sobolev

Session VI: Triassic-Jurassic extinction & LIPS

11:15-11:35

Invited

Volcanism of the Central Atlantic Magmatic Province as the trigger of environmental and biotic changes around the Triassic-Jurassic boundary
József Pálfy

11:35-11:50

The Pliensbachian–Toarcian (Early Jurassic) extinction, a global multi-phased event
Andrew H. Caruthers, Paul L. Smith, Darren R. Gröcke

11:50-12:05

Direct link between end-Triassic CAMP volcanism, C-cycle perturbation and mass extinction
Jacopo Dal Corso, Andrea Marzoli, Fabio Tateo, Hugh C. Jenkyns, Hervé Bertrand, Nasrddine Youbi

12:05-12:20

CAMP-related series of rapid climatic reversals caused the end-Triassic floral crisis – evidence from continental strata in Poland

Grzegorz Pieńkowski, Grzegorz Niedźwiedzki, Marta Waksmundzka

12:20-14:00 - **Lunch Break** – a wide variety of restaurants, snack bars & pubs are available around the Museum.

Session VII: End-Cretaceous mass extinction, Volcanism and Impacts

14:00-14:20

Invited

Volcanism, impacts and mass extinctions across the KTB

Gerta Keller, Thierry Adatte

14:20-14:40

Invited

Chicxulub impact and the KT breccia from North America to Brazil: Stratigraphy, age, nature and origin

T. Adatte, G. Keller

14:40-15:00

Invited

Timing of critical events around the Cretaceous-Paleogene boundary

Paul R. Renne, Alan L. Deino, Frederik J. Hilgen, Klaudia F. Kuiper, Darren F. Mark, William S. Mitchell, III, Leah E. Morgan, Roland Mundil, Jan Smit, Courtney J. Sprain

15:00-15:20

Invited

What the dinosaur record says about extinction scenarios

J. David Archibald

15:20-15:40

Invited

Latest Cretaceous continental vertebrates of Indo-Pakistan

Jeffrey A. Wilson, Gregory P. Wilson, Dhananjay M. Mohabey

15:40-16:00 - **Coffee/tea break**

16:00-16:20

Invited

The Mammals across the K/Pg boundary: Ecological selectivity and immigrant-fueled ecospace filling

Gregory P. Wilson, Casey J. Self

16:20-16:40

Invited

Extinctions and floral change at the K/Pg: Three decades on

Robert A. Spicer

16:40-17:00

Invited

Deccan volcanic eruptions and its impact on flora close to the Cretaceous-Paleogene boundary: palynological evidence

Bandana Samant, D. M. Mohabey

17:00-17:30

Discussion of Day's Events

17:30-19:00 - **Poster session and cash bar**

FRIDAY MARCH 29th

Session VII: End-Cretaceous mass extinction, Volcanism and Impacts continued

09:00-09:20

Invited

A review of likely atmospheric emissions from lava-forming and explosive super-eruptions: understanding the potential environmental effects?

Stephen Self, *Lori S. Glaze, Richard J. Brown*

09:20-09:40

Invited

Deccan SO₂ release across the KTB: integrating ⁴⁰Ar/³⁹Ar and palaeomagnetic chronologies with lava unit volatile contents

Mike Widdowson, *Simon P. Kelley, Conall MacNiocall*

09:40-10:00

Invited

The chlorine perfume of the Deccan Traps

Eric Font, *Sébastien Fabre, Anne Nédélec, Thierry Adatte, Gerta Keller, Brooks Ellwood, Cristina Veiga-Pires, Jorge Ponte, José Mirão*

10:00-10:20

invited

Boltys Crater record of post K/Pg event recovery and climate change

Iain Gilmour, *Dave Jolley, Simon Kelley, Robert Daly, Mabs Gilmour*

10:20-10:35

East Greenland flood basalt volcanism: duration, volatile flux and correlation to the Paleocene-Eocene thermal maximum

Christian Tegner, *Claus Heilmann-Clausen, Rune B. Larsen, Adam J. R. Kent*

10:35-10:50

Global carbon cycling: Major implications of some new insights on global zeolite occurrence

L.S. Campbell, *A. Dyer, C. Williams, P. R. Lythgoe, J. Hellawell*

10:50-11:05

The public impact of impacts: how the media play in the mass extinction debates

Steve Miller

11:05-11:30 - **Coffee/tea break**

11:30-13:00 - Session VIII: Concluding discussion and debate

13:00 – Close of meeting

ALPHABETICAL LIST OF POSTERS BY FIRST AUTHOR

Sharks across the K/T boundary at Stevns Klint, Denmark

Jan S. Adolfssen, David J. Ward

Ginkgophytes at the Permian-Triassic boundary: How diverse were they?

Kathleen Bauer, Evelyn Kustatscher, Michael Krings

Extremely fast LIP eruption rates as constrained from the Bushveld and Skaergaard intrusions

R. G. Cawthorn, R.B. Larsen, C. Tegner

Stevns Klint – a World Heritage candidate

Tove Damholt, Finn Surlyk, Anne Mehlin Sørensen

Miocene vegetation in the Columbia River Basalt Province, Washington State, USA

Alena Ebinghaus, David Jolley, Adrian Hartley, Malcolm Hole, John Millett

Magnetite dissolution by acid rains due to volcanogenic atmospheric halogen input: an “experimental” approach

Sébastien Fabre, Anne Nédélec, Eric Font

Prolonged intraplate volcanism in Eastern Australia: new finds, causes and effects.

Ian Graham, Lin Sutherland, Horst Zwingmann, Sebastien Meffre, Ross Pogson, Julian Hollis, Robin Offler, David Och, Leeora Gubbay-Nemes.

Triggers of Permo-Triassic Boundary Mass Extinction: Siberian Traps or Paleo-Tethys ignimbrite flare-up?

Bin He, Yu-Ting Zhong, **Yi-Gang Xu**, Xianhua Li

Inflated pāhoehoe flows and the style of emplacement of part of the Lesotho

Outlier, Karoo Continental Flood Basalt Province

Anne E. Jay, Julian S. Marsh, Vincent Courtillot, Frédéric Fluteau

Characterising the mantle source region(s) of continental flood basalts: A melt inclusion investigation of high-Mg volcanic rocks from the Paraná-Etendeka Large Igneous Province

Eleanor Jennings, Sally A Gibson, John Maclennan, Bob Thompson

The Kellwasser Event – A response to global plate reorganization?

Uwe Kroner, Marco Roscher

After the end-Permian mass extinction: the flora of the Early and Middle Triassic in Central Europe

Evelyn Kustatscher

Modeling the environmental effects of sulphur dioxide released by Deccan traps

G. Le Hir, M. Mussard, F. Fluteau, Y. Goddérès

The Deccan Flood Basalts – Mascarene Islands volcanic series: Petrology, geochemistry and geodynamics

Karim Malamoud, Alexander V. Sobolev, Frédéric Fluteau

The carbon isotopic composition of CAMP basalts

Andrea Marzoli, Jacopo Dal Corso, Sara Callegaro, Paul B. Wignall, Robert J. Newton, Hervé Bertrand, Giuliano Bellieni

Volcanism, impact, mass extinction and delayed recovery in the western North Atlantic and Caribbean

Paula Mateo, Gerta Keller, Hassan M. Khozyem, Thierry Adatte, Jorge E. Spangenberg, Nallamuthu Malarkodi

Trace fossils and related phenomena in the Brynglas Formation (Hirnantian) of Llangranog, west Wales.

Keith Nicholls, Jerry R Davies, Cynthia Burek

- The impact of sediments on triggering of the Permo-Triassic mass extinction
S. Novikova, C. Yallup, M. Edmonds, A.V. Turchyn, J. Maclennan, H. Svensen
- Late Maastrichtian, KTB and Early Danian global biotic and environmental stress linked to Deccan Volcanism
Jahnvi Punekar, Gerta Keller and Paula Mateo
- Response of foraminiferal assemblages to the Toarcian Oceanic Anoxic Event: biotic crisis and recolonisation
Matías Reolid, Boris L. Nikitenko, Abbas Marok
- Latest Ordovician and earliest Silurian brachiopods succeeding the *Hirnantia* fauna in Southeast China
Jiayu Rong, **Bing Huang**, Renbin Zhan, D.A.T. Harper
- The end-Devonian Hangenberg event: causes and consequences of a major bottleneck in vertebrate evolution
Lauren Cole Sallan
- Rapid fluctuations in stable isotopes during the Triassic-Jurassic extinction
Mark A. Sephton, Michael H. Engel, Randall S. Perry, Dan Jiao, Jonathan S. Watson
- Contributions from Deccan Volcanism to the K-Pg mass extinction
Thomas Tobin, Peter Ward, Joseph Kirschvink
- Post-impact plant macrofossils from the Boltsh Crater illustrate survival of a Cretaceous fern relict *Weichselia reticulata* into the Paleogene within a refugial geothermal ecosystem
Sergey V. Vikulin, Nadia Bystrakova, Harald Schneider
- The Cretaceous-Paleogene boundary section on Seymour Island, Antarctica
R. Whittle, J.A. Crame, J. Francis, J. Ineson, V. Bowman, J. Jackson
- The extent of volcanism at Permian-Triassic boundary: New constraints from mineralogy, geochemistry and geochronology of Bed 26 at Meishan section, South China
Yuting Zhong, Bin He, Yigang Xu