Inaugural UK-China Scoping Workshop:

Biosphere Evolution & Resilience

Announcement of Workshop
Nanjing, China 4–6 May 2015

The deadline for applications is 16:00 on Friday 27 March.
Applications received after this time will not be considered.

The Natural Environment Research Council (NERC) and National Natural Science Foundation of China (NSFC) are inviting applications from UK scientists to attend a jointly organised workshop in Nanjing on 4–6 May 2015. Over three days the aims will be:

- To develop the scientific case for a major, joint research programme in *Biosphere Evolution and Resilience* over Earth history.
- To define the scope of a proposal for a co-funded international cooperative programme between China and the UK, to focus on the stability and resilience of the Earth system through deep time to be written up directly following the meeting.
- To encourage new, and nurture existing UK-China research collaborations, enabling submission of future joint research projects and proposals.

Additional aims are:

- To identify priorities, necessary skills/training and delivery benchmarks for the strategic development of the existing, open source, NIGPAS Geobiodiversity Database as a combined, institutionally-maintained repository for biological and physical data relevant to the study of biosphere evolution.
- Develop plans for the establishment of a multidisciplinary UK-China short course series: including Sino-UK summer schools, field workshops, paleobiological data analysis courses (face-to-face and online), Earth system modelling skills, etc.

UK/China Biosphere Evolution and Resilience Programme workshop

NERC and the NSFC are scoping a major new investment in research into the co-evolution of Earth's physical and biotic systems. The workshop's outcome will inform any future call and will also generate ideas for future areas of research collaboration. Attendance at the workshop does not automatically enable project bids to be submitted or guarantee funding. Conversely, absence does not preclude bidding into any subsequent

call. There is no guarantee that any research funding will result directly from this workshop.

Background to the *Biosphere Evolution and Resilience* workshop

Deep-time research into the co-evolution of physical and biotic systems remains in its infancy. Each year new approaches are developed, new interdisciplinary partnerships forged, and exciting new fossil discoveries made that permit lesser known chapters of our planet's history to be incorporated into our emerging conceptual image. Investigations into how life and the planet have co-evolved to produce present conditions, diversity, and processes will allow us to make predictions about the future of Earth's environment. Through effective international collaborations between skilled scientists at the cutting edge of their disciplines we can begin to address key questions such as the conditions under which life first evolved; how biological complexity arose; how environmental change shaped — and continues to shape — biological diversity; how biological innovations can in turn effect environmental change; how ecosystems recover from extreme events such as mass extinctions, and the role that increases in morphological, developmental, and ecological complexity may have to impart stability and resilience to the biosphere in the face of environmental perturbations at a variety of scales across time and space.

At a joint UK-China workshop in Chengdu, China on 27 November 2014, five critical overlaps in mutual expertise and interests were identified, although this list is by no means exclusive.

- **The Proterozoic Earth system**
- **The Ediacaran-Cambrian transition**
- **The Palaeozoic biosphere**
- **Mass Extinctions (especially Permian-Triassic)**
- **The Mesozoic origins of modern evolutionary biota**

In addition to these issues an opportunity was identified to develop the Nanjing Institute of Geology & Palaeontology, Chinese Academy of Sciences (NIGPAS) Geobiodiversity Database (http://www.geobiodiversity.com/) as a primary tool to support Earth system research for these and future research projects. In order to fulfil this role the Geobiodiversity Database would need to be expanded to encompass physical as well as biotic data and tools developed to facilitate summarization, combination, analysis, and modelling of these data,

An overriding concept agreed at the Chengdu meeting was the intriguing notion that increasing ecosystem complexity and biodiversity leads to stability and resilience in the Earth system. Arising from this came questions such as: How did the Earth system reach the stability required for complex life to evolve; what role did biological innovation play in strengthening ecosystem resilience and stability; and has the co-evolution of life and the environment served to buffer the Earth system against external environmental perturbations, and if so, how? Naturally these issues also have implications for improving our understanding of the modern (and future) worlds as well as those of the deep past.

To answer such questions, there is an urgent need for an integrated approach that embraces multidisciplinary thinking and international / global collaborations. To this end, applications are invited from researchers from all fields of palaeo-environmental research, including palaeobiology, geology, geochemistry and Earth system modelling.

The workshop – how to apply

To attend the workshop you must complete the expression of interest ("EoI") form, following the instructions provided on the form. The form, together with a CV of no more than two sides of A4, should be sent to Nicky Lewis at nile@nerc.ac.uk by 16:00 on Friday 27 March 2015. Invited participants will be notified in the week commencing 30 March 2015. Submission of these documents will be taken as indicating availability on the dates of the workshop.

Applicants should outline their relevant area of expertise, any current overseas collaborations and links, and their personal rationale for being involved in the workshop. They should also state in which of the workshop themes they have a specific interest (or suggest additional themes of mutual interest). Please note that the total number of participants from the UK is limited and NERC will try to ensure a balance of different disciplines/expertise and the number of attendees from the same institution. It is expected that up to 15 UK participants will be invited.

NERC will cover all reasonable travel expenses for UK participants attending the workshop in line with NERC policy on recovering travel and subsistence. Accommodation and subsistence expenses whilst in China will be covered by NSFC.

Additional activities on 7-8 May 2015

To maximize benefit, Chinese hosts are willing to sponsor accommodation through until 9 May, in order for participants to engage with research students and early career researchers from throughout China by participating in one to two days of education and training. NERC would appreciate if applicants could express their willingness to give talks/provide training on one of those additional days.