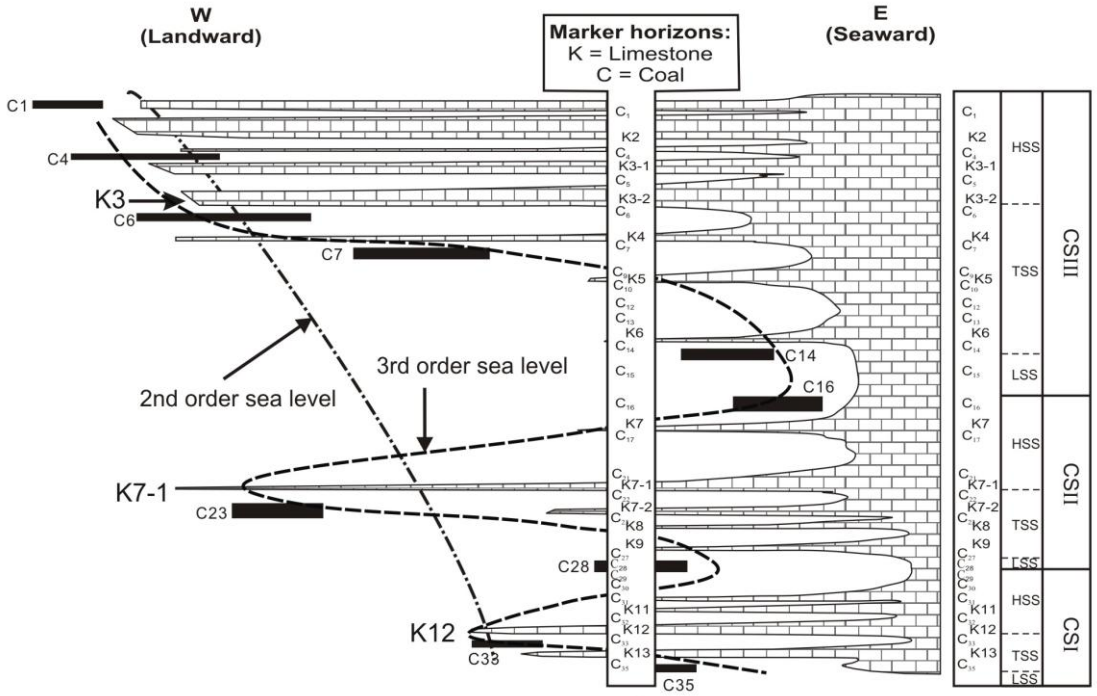
Out with a bang? Evaluating biotic turnover in terrestrial settings from the Guadalupian and End-Permian mass extinctions

Supervisors: Dr Jason Hilton & Dr J. Wheeley (GEES), **Professor Longyi Shao** (China University of Mining and Techhnology, Beijing), **Professor Shijun Wang** (Institute of Botany, Chinese Academy of Sciences, Beijing)

Recent studies on the Guadalupian and End Permian mass extinctions demonstrate abrupt changes to spices composition in marine settings but are unequivocal about the presence, extent and timing of extinctions in contemporaneous landmasses (Bond *et al*. 2010). Challenges of correlation and stratigraphy in terrestrial sedimentary facies are evident from which few fossil plant bearing horizons have been placed within accurate stratigraphical frameworks (Stevens *et al*. 2011). This project will focus on fossil plant assemblages between the Guadalupian (mid-Permian) and End Permian extinctions in SW China and will use a recently developed sequence stratigraphic framework for the terrestrial to marine settings developed by Wang *et al.* (2011) as a temporal model in which to accurately determine the patterns and tempo of species turnover. The stratigraphic model at present correlates the terrestrial Xuanwei Formation with the marine Wuijiaping and Changxing Formations via the mixed terrestrial and marine facies of the Longtan and Wangjiazhai formations. These formations contain fossil plants at various horizons (Seyfullah *et al*. 2010), so the project will commence collating and critically evaluating previous palaeobotanical accounts in collaboration with Professor Wang in order to determine species ranges and their relationship to sea level and environmental change. The sequence stratigraphic model will then be expanded into adjacent areas in collaboration with Professor Shao; this will allow additional plant fossil records to be evaluated and placed into the same framework to provide a regional synthesis of floral turnover. Research will include trips to China to work with Professors Shao and Wang, to undertake fieldwork to collect new data, and to evaluate specimens in existing museum collections. Results will include a sequence stratigraphic model for all of South China and will provide a temporal framework for plant evolution and extinction to assess the extinction on land from the Guadalupian and End Permian extinctions.



Wang et al. 2011: marker horizons and sea level change from the sequence stratigraphic framework

This project links with longstanding research collaboration between Hilton and Wang/Shao on the fossil floras of China and profound episodes of biotic turnover, and on environmental change in deep time in Birmingham by Smith, Hilton and Wheeley. The project is tied in with funded research currently being undertaken in Beijing by Wang, Shao and Hilton on evolutionary investigations of anatomically preserved plants from the Xuanwei Formation. The successful applicant would join a vibrant research group with experience in organismal biology in deep time and biotic responses to environmental change.

Methods to be used: Fossil plant identification; stratigraphic range determination; evaluation of fossil plant taphonomy and preservational bias; sedimentary facies analysis, sequence stratigraphy.

Candidate background: The successful candidate is anticipated as having a geosciences background including familiarisation with sedimentology and sequence stratigraphy, but candidates from biological backgrounds are also encouraged to apply but will need to learn core geological skills and methods at the start of the project. The successful candidate must be adaptable and able to undertake fieldwork in physically challenging settings.

For further information contact Jason Hilton (j.m.hilton@bham.ac.uk) or James Wheeley j.r.wheeley@bham.ac.uk.

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