

Evaluating records of environmental change and mass extinctions during the Early Paleozoic

McKenzie, N.R.¹, Gill, B.C.², Wernette, S.J.³, Chen, J.⁴, Park, T.-y.⁵, Myrow, P.M.⁶, & Hughes, N.C.³.

¹University of Hong Kong, Pokfulam, Hong Kong,
ryan00@hku.hk

²Virginia Polytechnic Institute and State University,
Blacksburg VT USA, bcgill@vt.edu

³University of California, Riverside, Riverside CA USA,
swern001@ucr.edu

⁴Nanjing Institute of Geology and Palaeontology, Chinese
Academy of Sciences, Nanjing, China,
jitaochen@126.com

⁵Korea Polar Research Institute, Incheon, Republic of Korea,
typark@kopri.re.kr

⁶Colorado College, Colorado Springs, CO USA,
pmyrow@coloradocollege.edu

⁷University of California, Riverside, Riverside CA USA,
hughesnc@ucr.edu

The interval between the Cambrian ‘explosion’ and the Great Ordovician Biodiversification Event (GOBE) is marred by biotic turmoil. Several mass extinction events have been recognized throughout the Cambrian, with multiple Furongian (late) Cambrian extinctions mostly seen within trilobite fauna of North America. These extinctions appear to correspond with episodic ocean anoxia and carbon cycle perturbations, all of which are set to the backdrop of an extensive greenhouse climate. Here we will present new chemostratigraphic and compiled biostratigraphic data from Cambrian successions of the North China/Sino-Korean block (NCB). These data help identify newly recognized trilobite extinctions in upper Cambrian carbonate platform deposits of the NCB that may be correlative to North American events, demonstrating their global extent. These extinctions also correspond with marked $\delta^{13}\text{C}$ excursions. The cessation of these repeated extinctions coincides with global reductions in arc-volcanism and climatic cooling, implying a causal linkage between baseline climate conditions and this extensive interval of biospheric perturbations. Collectively, these data help further elucidate the harsh environmental conditions that hindered early animal evolution.