

## **Environmental fluctuation triggered the Cambrian explosion?**

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The diversification of metazoans during the latest Neoproterozoic and early Cambrian has been attributed to a progressive rise in surface oxygen levels. However, recent work has also questioned the idea of a prominent rise in atmospheric oxygen levels or a major shift in the marine redox landscape at the onset of Phanerozoic. Here, we present new uranium isotope data from upper Ediacaran to lower Cambrian marine carbonate successions in South China. These data provide evidence for short-lived episodes of widespread marine anoxia near the Ediacaran-Cambrian boundary and during Cambrian Age 2. We suggest that these environmental perturbations triggered biotic turnover and that resulting ecological restructuring, rather than progressive oxygenation, was a potentially dominant driver of the Cambrian explosion. Episodes of the harsh environmental conditions in the general trend towards higher level of oceanic oxygenation on the eve of the Cambrian explosion could have, by promoting ecosystem restructuring, have induced the diversification of the Cambrian Evolutionary Fauna.