

Ediacaran-Cambrian transition nitrogen isotope systematics

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The Ediacaran-Cambrian transition in South China is characterised by high productivity, leading to widespread deposition of phosphorite deposits and black shales associated with anoxia / euxinia. Trace metal enrichments suggest that euxinia was a relatively localised phenomenon, while Mo isotopes indicate further that the global extent of anoxic seafloor reached its modern day low point during this transition. The apparently contradictory appearance of euxinia at the same time as global ocean oxygenation, consistent with the appearance of the first motile and complex metazoans, resists simple explanation, and implies complex redox distributions along the Yangtze Platform margins. In this study, new and published nitrogen isotope compositions of Ediacaran-Cambrian transition (560-520 Ma) strata will be presented. $\delta^{15}\text{N}$ values are seen to be consistent within a section but highly variable between sections which implies that the source of nutrient 'fixed' nitrogen was strongly controlled by basin palaeogeography. The development of euxinia on margins and intra-platform basins is seen to be dependent upon open access to the more oxygenated parts of the ocean due to upwelling and/or transgression. In South China, nascent animal ecosystems developed on the margins of these more anoxic, and largely deeper marine realms.