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Spatial Variations of Organic and Inorganic Carbon Isotopic Composition during the Permian/Triassic Mass Extinction in South China

LUO Genming¹, HUANG Junhua¹, Thomas ALGEO², LEI Lidan¹ and XIE Shucheng¹

1 China University of Geosciences

2 University of Cincinnati YIN Hongfu

The Permian/Triassic (P-Tr) mass extinction was accompanied by large perturbation in the global carbon cycle. Large negative shifts in both $\delta^{13}\text{C}_{\text{carb}}$ and

$\delta^{13}\text{C}_{\text{org}}$ have been identified during the P-Tr transition in the sections distributing nearly all around the world. However, little attention has been paid to the spatial difference in the evolution of $\delta^{13}\text{C}_{\text{carb}}$ and $\delta^{13}\text{C}_{\text{org}}$ in this critical interval. We compiled our new data and previously-published data from five transects of different sedimentary environmental conditions in South China Block, showing a strong spatial variation in $\delta^{13}\text{C}_{\text{carb}}$ and $\delta^{13}\text{C}_{\text{org}}$. Except for the Shangsi section, the other

transects show a distinct, from 2-3‰ to 0-1‰, decline in the $\delta^{13}\text{C}_{\text{carb}}$ gradient from shallow-water to deep-water. This decline might be caused by the abrupt decrease in primary productivity after the mass extinction, particularly in the ocean that changed from well mixing to stagnant in this interval. The spatial variation of $\delta^{13}\text{C}_{\text{org}}$ is much more complex; both decrease and slight increase were present during the P-Tr transition. The differential variation of $\delta^{13}\text{C}_{\text{org}}$ might be ascribed to the increase in the flux of terrestrial organic matter or the bloom of green-sulfur bacteria after the mass extinction.

* Corresponding author. E-mail: logming@gmail.com