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Climate change across the Permian–Triassic Boundary – from cool-house to hot-house

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The Permian-Triassic Boundary (PTB) is the most severe mass extinction event in Earth history. More than 90% of all skeleton producing species went extinct. To explain this event, numerous extinction mechanisms have been proposed, including bolide impact, global anoxia, sudden climate change and ocean poisoning. However, rigorous testing of these hypotheses is hampered by the lack of reliable proxy paleoenvironmental data. Thus, the processes that led to the catastrophe have still not been completely unraveled. Previous studies of oxygen isotopic variation across the PTB have relied on isotopic analyses of whole-rock samples because of the absence of suitable calcareous fossils spanning the interval. Unfortunately, the oxygen isotopic compositions of carbonate sediments are easily modified by post-depositional alteration (diagenesis). Using measurements of conodont phosphate, we present $\delta^{18}O$ records from four different localities giving evidence of a significant change in oxygen isotope composition across the boundary. We interpret the data as a climate change towards warmer temperatures at the PTB.