Tropical basaltic weathering during the end-Permian rapid warminng

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Basatsic weathering is critical to understand the cliamte-weathering interactions. Studies based on present-day weathering data suggested that basatlic weathering is sensitive to the land surface temperature. But the reponse and feedback of basaltic weathering to rapid warming are still open questions. Here we present a study on the end-Permian basaltic weathering in South China. In the end-Permian, South China was located in the equatorial latitude and there developed the Emeishan large igneous province in its western part at ~260 Ma. Provenance data of the Late Permian-Early Triassic sedimentary rocks in the adjacent Youjiang Basin denoted a basaltic source in the Emeishan LIP. We focus on two cored Permo-Triassic successions. High-precision zircon U-Pb dating and organic carbon isotopes were combined to constrain the Permo-Triassic boundary. Mineralogical and geochemical compositions were obtained for the mudrocks. They were used to track the source weathering trends, which represent the sequential variation of the surface weathering degree in the Emeishan LIP. These data reveal a rapid weakening in the chemical weathering of the Emeisahn LIP basats during the end-Permian warming. This weatheirng-climate relationship is at odds with what we know from present-day landscape studies. We interpret this anomalous signal of tropical basaltic weathering at the end-permian to mass wasting related to enhanced tropcial storms. This study support the cliamte model assertation that rapid climate warming would induce increases in the frenquency and intensity of tropical storms.

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