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The intrusive record of the CAMP and what it means for the end Triassic mass extinction

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The end-Triassic mass extinction is one of the Phanerozoic's five largest mass extinctions. The extinction is usually attributed to climate change associated with degassing of erupting basalt from the Central Atlantic Magmatic Province (CAMP). However, recent work has shown that the earliest known CAMP basaltic flows occur stratigraphically above the extinction horizon indicating that the relationship between the CAMP and the extinction is more complex when resolved at higher temporal resolution. Here we present new high-precision U-Pb age determinations from intrusive units, which show that CAMP magmatic activity was occurring ∼100 ka before the oldest known eruptions. We show that the early magmatic activity correlates temporally with the onset of globally recognized changes to climatic and biotic records. We also report ages from sills in the Amazonas basin in Brazil that intrude synchronously with the extinction. We suggest that the release of thermogenic gases from the contact metamorphism of these sediments induced by injection of mafic sills may have contributed to the climate change that drove the extinction. Our results indicate that the intrusive record from large igneous provinces may be more important for linking to mass extinctions than the eruptive record.