Sensitive responses of modern coral reefs by 1991 Mount Pinatubo volcanic eruption

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Widespread coral bleaching and mortality has occurred intensively and frequently under global warming conditions since the phenomenon was first documented in the early 1980s. However, abrupt and extensive mortality episodes, such as which occurred in the South China Sea (SCS) in mid-1991, cannot be explained solely on the basis of high summer sea surface temperatures. Here we examine this event in the light of time series rare earth elements, trace element Al/Ca ratios, and micro-domain images from coral samples collected in the SCS region. Results demonstrate that modern coral reefs were strongly imposed by a giant volcanic eruption, the 1991 Mount Pinatubo volcanic eruption. Our findings highlight that contemporary continental near-shore reefs are more susceptible than their open-ocean counterparts.