



## **Catastrophe at the end of the Cretaceous? Shallow marine biodiversity, palaeoecology, and the complexities of the Cretaceous-Paleogene (K-Pg) mass extinction event**

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The Cretaceous-Paleogene (K-Pg) mass extinction event 66 million years ago is the most recent of the 'Big Five' Phanerozoic extinction events and is associated with the loss of non-avian dinosaur-dominated ecosystems on land, and marine reptiles and ammonoid cephalopods (ammonites) in the oceans. It is now almost forty years since Alvarez et al. proposed this extinction was caused by a catastrophic bolide impact (now known to be responsible for formation of the Chicxulub crater in the Yucatan Peninsula, Mexico), and a vast body of work supports this hypothesis. However, the extinction also coincides with the emplacement of the large Deccan Traps Large Igneous Province (LIP) in India, which based on high-precision dating, occurred over a <1 million-year period coinciding with the K-Pg boundary. Given the evidence that LIP volcanism is ultimately responsible for at least three of the other 'Big Five' extinctions, disentangling these phenomena is critical to understanding the fate of various groups at the K-Pg boundary. Did volcanism cause extinctions and instability prior to the Chicxulub impact? How were common groups like ammonites faring during the latest Cretaceous? What processes led to the formation of complex sedimentary deposits coincident with the K-Pg boundary? And did sea level change play a role in the record of the extinction? We are investigating these questions using faunal and geochemical data from K-Pg successions in the United States Gulf Coastal Plain, which demonstrate the complexities of the extinction event and recovery in shallow marine settings proximal (~1500 km) to the Chicxulub crater.