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Joint 69th Annual Southeastern / 55th Annual Northeastern Section Meeting - 2020

Paper No. 56-1

Presentation Time: 8:00 AM-12:00 PM

GEOCHEMICAL AND SEDIMENTOLOGICAL ANALYSIS OF LATE CRETACEOUS FOSSIL-BEARING LOCALITIES ASSOCIATED WITH THE DECCAN TRAPS (INDIA)

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The Deccan Trap volcanic province, located in western and central India, erupted during a ~1 M.y. period encompassing the Cretaceous-Paleogene (K-Pg) boundary. As such, it has been proposed as a causal or contributing factor to the K-Pg mass extinction. Although global effects of Deccan Trap volcanism remains unclear, its effects on local environments on the Indian subcontinent are recorded in sedimentary strata deposited prior to ("infratrappean") and between ("intertrappean") local eruptive events. These strata and associated biotic remains can provide windows into the local environmental conditions that can reveal the climatic and biotic response to volcanism. The difference in timing between the first arrival of lava flows in an area can potentially be used to parse the differences between local and regional responses. If the transition to a higher intensity weathering environment is not associated with the timing of initiation of local volcanic influence, then this change is likely a broad regional climatic signal.

The local effects of volcanism have been difficult to study due to the incomplete nature of exposure and high surficial weathering rates due to India's tropical climate. However, a variety of fossil-bearing sites have been identified around the eastern periphery of the volcanic province, from which sedimentary logs and geochemical samples have been obtained. Major, minor, and trace element concentrations were measured on homogenized sediment samples that were acid-digested and introduced to an ICP-OES for analysis. In combination with physical sedimentological observations, these results indicate that many vertebrate fossils are preserved in shallow lakes that collect intensely weathered sediment (mostly clay) of likely basaltic origin. In some localities, this work indicates that prior to the local appearance of lava flows, clay with a likely volcanic provenance is still a major component of the sediment.

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