Sources of Sediment to Site U1474

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Little is known about the paleoclimate of southeastern Africa around the Mid-Pleistocene Transition (MPT). Sediment from continental shelf marine cores can be used to provide valuable information about paleoclimate. This study used sediment from IODP Expedition 361 Site U1474 to examine changes in rainfall along the southeastern African coast after the MPT, from 0.536 to 0.744 million years ago. A refined timescale for the interval was created using the oxygen 18 values of benthic foraminifera shells from samples at a 3000-year resolution. The sediment provenance of the samples was characterized using K-Ar isotopic dating, as well as the Fe/K elemental ratio from the Site U1474 X-Ray Fluorescence (XRF) record. The Fe/Ca elemental ratio was also used to constrain the amount of terrigenous sediment entering the site. Isotopic Carbon-13 values were used to examine the changes in deep-water masses across the interval and explore the possibility that a deep-water current may be contributing sediment to the site. It was originally believed that sediment entered the site from two primary sources: the Limpopo River and smaller rivers along the Natal Coast. However, the two provenance proxies, K-Ar and Fe/K, did not follow the same trends along the interval, indicating that there is at least one additional significant sediment source to the site. The K-Ar data and Carbon-13 record showed some correlation, and so a deep-water current could be contributing sediment to the site. Changes in rainfall could not be constrained due to the unanticipated addition of other sediment sources, complicating analysis of climate signals. While no hypotheses about changes in the paleoclimate could be made, the results of the study can be used to better understand sediment transport along the southeastern African coast.