

K/Ar provenance ages from Natal Valley Sediments

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K/Ar provenance ages (using the method of Hemming et al., 2002, Chem. Geol.) are presented for terrigenous sediments from core CD154-10-6P (31°10.36' S, 032°08.91' E, 3076 m water depth) from the Natal Valley, SW Indian Ocean. This core is near the beginning of the Agulhas Current, and the sediments were deposited in a drift from NADW. The K/Ar ages of carbonate-free <63µm sediments (assumes 2%K; element analyses are in progress) were determined for 43 samples for this pilot study. A previous in-depth study of the core, including XRF-scanning (Simon et al., 2015, Sci. Rep.) demonstrated a variation in the Fe/K ratio with a precessional pacing. K/Ar ages from intervals around 50 and 150 ka range from 180 to 316 Ma with older provenance ages corresponding with higher Fe/K, inferred to be times of greater rainfall in the nearby river catchments. Our interpretation is that the data reflect changing sources from the nearby African continent through a combination of variations in sea level, runoff and weathering. The local river catchments (most importantly Tugela) are short and transect a range of geology, and sediments from the Limpopo and Zambezi catchments to the north integrate larger regions with generally older ages. Contributions from southern sources, delivered by the northward flowing undercurrents such as NADW, could also contribute. The systematic co-variation with precession suggests that improved understanding the provenance will lead to a greater understanding of the processes linking climate and ocean in this region.