



## **Toward a Late Quaternary tephrostratigraphic framework for East African palaeoenvironmental records**

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Understanding the spatial and temporal variability of climate forcing and environmental response across a continent as climatically diverse as Africa relies upon comparison of data from widespread palaeoenvironmental archives. Accurate, precise and independent chronologies for such records are essential; however this remains a challenge in many environments, often preventing the valid comparison of detailed palaeo-proxy records. Many studies have now shown that volcanic ash (tephra) can be detected in terrestrial and marine sediments thousands of kilometres from their source, often as microscopic or “cryptic” layers. As well as offering opportunities for both direct (e.g. by  $^{40}\text{Ar}/^{39}\text{Ar}$  methods) and indirect (e.g. by associated  $^{14}\text{C}$  dates) dating of the sediment sequence, tephra layers can provide stratigraphic tie-lines between archives, facilitating precise correlations at single moments in time. Furthermore, where two or more tephra layers are co-located in multiple records, rates of change can be compared within a period of equivalent duration, even in the absence of absolute age estimates. Investigations into the presence of visible and non-visible (crypto-) tephra layers within lacustrine palaeoenvironmental records of the last  $\sim 150$  ka BP from across East Africa are revealing the potential for this approach to (i) correlate palaeoclimate archives from across and beyond tropical Africa within a regional tephrostratigraphic framework; (ii) provide age constraints for individual core chronologies, in particular beyond the limits of radiocarbon dating; and (iii) increase our knowledge of the history of Late Quaternary explosive volcanism in East Africa.