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# ICDP project DeepCHALLA: reconstructing East African climate change and environmental history over the past 250,000 years

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Sediments on the bottom of Lake Challa, a 92-meter deep crater lake on the border of Kenya and Tanzania near Mt. Kilimanjaro, contain a uniquely long and continuous record of past climate and environmental change. The near-equatorial location and exceptional quality of this natural archive provide great opportunities to study tropical climate variability at both short (inter-annual to decadal) and long (glacial-interglacial) time scales; and the influence of this climate variability on the region's freshwater resources, the functioning of terrestrial ecosystems, and the history of the East African landscape in which modern humans (our species, Homo sapiens) evolved and have lived ever since.

Supported in part by the International Continental Scientific Drilling Programme (ICDP), the DeepCHALLA project has now recovered the sediment record of Lake Challa down to 214.8 meter below the lake floor, with almost certain 100% cover of the uppermost 121.3 meter (ca.150,000 year BP to present) and estimated 85% cover over the lower part of the sequence, down to the lowermost distinct reflector in the available seismic stratigraphy. This reflector represents a 2 meter thick layer of volcanic sand and silt deposited ca.250,000 years ago, and overlies still older silty lacustrine clays deposited during early lake development. Down-hole logging produced continuous profiles of in-situ sediment composition that confer an absolute depth scale to both the recovered cores and their three-dimensional representation in seismic stratigraphy. As readily observed through the transparent core liners, Lake Challa sediments are finely laminated throughout most of the recovered sequence. Combined with the great time span, the exquisite temporal resolution of these sediments promises to greatly increase our understanding of tropical climate and ecosystem dynamics, and create a long-awaited equatorial counterpart to the high-latitude climate records extracted from the ice sheets of Greenland and Antarctica.