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Pan-African Megadroughts, Post-70 ka Climate Release, and the Expansion and Exodus of Early Modern Humans: Results of Deep Lake Drilling in East and West Africa

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Lakes Malawi, Bosumtwi and Tanganyika in tropical Africa contain high-fidelity records of terrestrial climate change of unparalleled continuity and antiquity. New scientific drill cores reveal evidence of periods of severe aridity in Africa prior to 70 ka, when the water volumes of Lakes Malawi, Bosumtwi, and Tanganyika were reduced by $>$95%, 100%, and $>$50% respectively. The long, continuous drillcores from Lake Malawi provide evidence of several intervals of megadrought between 130 and 70 ka, when lake levels dropped to more than 550 m below modern levels. The rise in lake levels after 70 ka indicates a change to a period of wetter, stable conditions, and is coincident with diminished orbital eccentricity, and associated reduction in precession-dominated climatic extremes. The observed transition is interpreted as a major change in the mode of tropical climate forcing, from precession-dominated

tropical climate, to one forced by high-latitude processes linked to the global thermohaline circulation. This climate transition to decreased environmental variability and more hospitable tropical African climate after 70 ka likely played an important role in the expansion of early modern human populations, and the final early modern human exodus from Africa.