

## **Quaternary Climate Changes in Arabia**

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Quaternary climatic fluctuations occurred in Arabia culminating in present-day hyperarid conditions. Evidence of these changes is found in historical records, radiocarbon dating, U/Th ratios and oxygen isotope ratios. The Rub' al Khali, the world's largest continuous sand-dune desert (650,000 km<sup>2</sup>), has existed since 6.2ka BP. Arab historians record that 0.7–1.3ka BP was moister when the Hofuf River flowed. The Sabaeen and Kinda kingdoms flourished 1.4–2.1ka ago during moister conditions. Radiocarbon dating of Neolithic remains shows moister conditions 5–5.5ka BP. Hyperarid high-crested dunes existed 5.5–6ka ago. A 'Neolithic Wet Phase' 6.2–9.7ka BP with interdune lakes in the Rub' al Khali, was preceded by a 7ka hyperarid interval. A pluvial interval 17–36ka ago caused 130 m sea-level lowering, no Persian Gulf, and lakes in the Rub' al Khali. Aridity 36–70ka BP caused movement of sand from wadis flowing into the shrunken Persian Gulf under the influence of predominant northerly trade winds. Speleothem U/Th dating indicates 70–270ka BP was moist, while the preceding interval to 325ka ago was arid with dry caves. Karstification 325–560ka BP due to wetter climate is shown by U/Th speleothem dates. Oxygen isotope ratios suggest warmer arid climates 560–700ka ago with beginning low dunes, while 700–2000ka BP was cooler, with well-developed drainage systems and large bordering alluvial fans.