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Rapid environmental changes of the Late-glacial and Holocene in a sediment record from the Yagour Plateau, High Atlas, Morocco

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The High Atlas mountains of Morocco represent a climatological frontier between the Atlantic and Saharan realms as well as a site of major Pleistocene glacier expansion. However, Late-glacial and Holocene environmental change is weakly constrained, leaving open questions about the influence of high- and low-latitude climate forcing and the expression of North Atlantic rapid climate changes. High elevation lakes on the sandstone plateaux of the High Atlas have been recognised as archives of Late Quaternary environmental change but remain little explored. Here, we present findings from new sedimentological, palaeoecological and geochronological investigation of a lake marginal sediment core recovered in June 2019 from the *Ifard* Lake located on the Yagour Plateau. The plateau is a distinctive sandstone upland located to the southeast of Marrakech in the High Atlas (31.31°N, 7.60°W, 2460 m.a.s.l.). The lake is located within a small, perched catchment area, offering an opportunity to isolate catchment effects and investigate atmospheric deposition of organic and inorganic tracers of past environmental change. The core stratigraphy reveals shifts between inorganic sands and lake muds with fluctuations in grain sizes and sediment reddening. The differences in these stratigraphic layers are most likely linked to hydrological changes associated with changing snowpack conditions and local catchment erosion dynamics. The core chronology is well-constrained by AMS radiocarbon dating of pollen concentrates, with the core sequence spanning the last ca. 14,000 years. The driving agents of environmental change on the plateau are inferred using a multiproxy approach, combining sedimentological analyses (particle-size by laser granulometry, elemental analysis by core-scanning XRF, C/H/N/S analysis), palynology (pollen, spores, non-pollen palynomorphs) and contiguous macrocharcoal analysis. High-resolution, well-constrained proxies therefore permit novel regional insights into past environmental and climatic changes at centennial timescales. A prime working hypothesis is that the imprint of wider palaeoclimatic changes of both the North Atlantic region and Saharan realm (African Humid Period, AHP) is detected at this site. Key climatic periods such as the Younger Dryas and multi-centennial cooling episodes around 8000 and 4200 years ago are distinctly characterised in the record by finer grain sizes and the accumulation of

pollen-rich material and charcoal. These responses are thought to be governed by regional climate forcing and local snowmelt moisture supply to the Yagour Plateau. An increase in fine sediment supply, magnetic susceptibility and Fe content in the upper part of the core may be related to enhanced atmospheric dust deposition following the end of the AHP. Whilst taking anthropological influences on the local environment into account, this study will contribute to the detection of long-term and rapid climate changes in a sensitive mountain region at the rim of the Atlantic and Saharan climate systems.