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The patchwork loess of Central Asia: Implications for interpreting aeolian dynamics and past climate circulation in piedmont regions

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Reconstruction of mass accumulation rates (MARs) in loess deposits are widely used for interpreting long-term aeolian transport and climate dynamics in terrestrial environments. However, these interpretations are often driven by a preponderance of reconstructions from individual or selected sites, which can bias our understanding of past climate, especially in the absence of other proxy information. Recent studies on MARs from multiple loess sites in Arid Central Asia (ACA) reveal disparities in the timing of peaks in accumulation between sites, as well as asynchronies with loess flux in the Chinese Loess Plateau (CLP). We investigate this issue by (1) dating five new sites from the western Ili Basin, therefore

extending the spatial cover of loess chronologies across ACA and (2) combining that with MARs from >30 sites across ACA and the CLP over the last 60 ka. Our results indicate spatio-temporal inhomogeneity in the timing and rate of loess deposition across the ACA, and highlight the importance of interrogating local and regional influences on dust supply and transport. Our synthesis of MARs from ACA and the CLP suggests that the timing of peak dust flux as an indicator of large-scale climate dynamics is best derived from an aggregate of sites; this removes site-specific bias where local processes or topographic settings outweigh the climate signature.

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Lateglacial and Early Holocene Palaeoenvironmental Change and Human Activity at Killerby Quarry, North Yorkshire

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The hunter-gatherers that entered the British peninsula after ice-retreat were exploiting a dynamic, rapidly changing environment. Records of vegetation change and human occupation during the Lateglacial to Early Holocene in northern Britain are more commonly found at upland and cave sites. However, recent research highlights many areas of the Swale–Ure Washlands that preserve extensive environmental sequences in low-lying ice-wastage basins, channels and depressions. The Lateglacial–Early Holocene environment of Killerby Quarry, North Yorkshire, is investigated here using a multi-proxy approach of sedimentary ancient DNA (sedaDNA), pollen, sedimentological (geochemistry and portable optically stimulated luminescence), and rare and

well-preserved archaeology (Lavvu structures and lithics). Results show that the wetland basins and kettleholes were small lakes or ponds in the Lateglacial surrounded by sedge-fen and birch woodland. A gradual (centennial scale) succession to reed-swamp and then marsh is seen by the Early Holocene. This environment formed the resource-scape for hunter-gatherer transitory settlement in both the Lateglacial (Late Upper Palaeolithic) and Holocene (Early Mesolithic), attracted by the rich communities of pond-related flora and fauna as well as easy strategic landscape access by way of the River Swale, an arterial route through the landscape connecting the North Sea Basin with the Pennine uplands via the palaeolakes around Killerby.