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Holocene dune accumulation in the Youledusi Basin of Tianshan Mt., NW China [U+FF1A] Response to the westerly-dominated climate in arid central Asia

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Understanding the spatial and temporal patterns of climate change in a given region may provide insights into the underlying climate-forcing mechanisms. In east and south Asia, Asian monsoon variations during the Holocene have been well-documented by precisely dated cave deposits, peat and lake and marine sediments. However, Holocene climate patterns in arid central Asia (ACA) dominated by the Westerlies are poorly documented and understood. Although there have been some published studies on lake cores recording Holocene moisture evolution in the ACA, we still know little about the climate evolutionary patterns and mechanisms that drive the westerlies. In the arid areas aeolian dunes are often regarded as indicators of past aridity, and the development of palaeosol implicates relatively wet condition. This study will first provide the chronostratigraphy of a set of palaeodunes in the Youledusi Basin (ca. 2400 m above sea level) of Tianshan Mt., NW China. Systematic optically stimulated luminescence dating (ca. 60 samples) of multiple sites (eight sections) is used together with stratigraphic analysis in order to reconstruct the evolution of the sand dunes, which is able to infer the history of Holocene moisture variation.