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Simulated precipitation changes in Central Asia since the Last Glacial Maximum

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1 Simulated precipitation changes in Central Asia since the

2 Last Glacial Maximum

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13 **Abstract** The availability of freshwater has been and remains a crucial concern in
14 westerlies-dominated arid Central Asia. Understanding precipitation changes in this
15 area and the underlying mechanisms, therefore, is of great importance. This study
16 explores precipitation changes in Central Asia (35°–50° N and 50°–70° E) since the
17 Last Glacial Maximum (LGM) and their control factors using results from the
18 “Simulation of Transient Climate Evolution over the last 21,000 years”. Transient
19 simulations reveal that a wet climate occurred during the LGM, the Bølling-Allerød
20 warm period, and the middle Holocene, and a dry climate occurred during Heinrich
21 event 1, the Younger Dryas, and the early Holocene in this area. Model results are in
22 good agreement with proxy records since the last deglaciation. These changes were
23 mainly controlled by Earth's orbital parameters, meltwater discharges into the oceans
24 and continental ice sheets. The contribution of GHG concentrations to precipitation
25 changes was minor. External forcing factors influenced the precipitation mainly
26 through affecting the water vapor input from the North Atlantic and Mediterranean
27 Sea, and vertical motions of the atmosphere over Central Asia. The North Atlantic

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