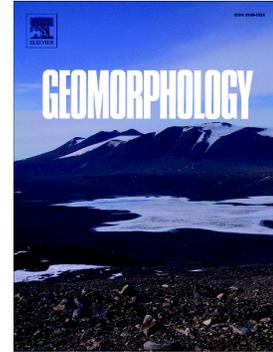


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Implications of (reworked) aeolian sediments and paleosols for Holocene environmental change in Western Mongolia

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Abstract

In the semi-arid to semi-humid regions of western Mongolia four different geomorphological aeolian and fluvial archives were investigated in order to gain environmental information of landscape evolution during the late glacial and the Holocene. These archives, which contain aeolian deposits, fluvial sediments, and paleosols, are situated upon glacial moraines, fluvial terraces, floodplains, or mountain slopes. While radiometric dating provides information about the age of the sediment and paleosols, grain size and element distribution provide information about the sediment source and soil development.

Extensive aeolian sediment transport occurred from 17 to 10 ka during the late glacial when climate was cold and dry. Since that period the developing steppe and alpine meadow vegetation served as a dust trap. During the warm and wet early to mid-Holocene sediment transport was reduced under a dense vegetation cover. All paleosols of the investigated archives show late Holocene ages which point to an environmental turning point around 3 ka. Since then, the Neoglacial period started with cooler climate conditions and periglacial processes intensified again. Recognizable glacier advances occurred during the Little Ice Age several centuries ago. Since then, global climate change leads to warmer and more arid conditions. During the late Holocene, a new period of strong geomorphological activity started and huge quantities of aeolian, colluvial and fluvial sediment accumulated. These intensified soil relocation processes cannot be explained exclusively by climate change because there are no explicit indications found in the palynological and lacustrine records of Mongolia. This discrepancy suggests that the additional factor of

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