

EGU2020-3185

<https://doi.org/10.5194/egusphere-egu2020-3185>

EGU General Assembly 2020

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## **An n-alkane-based Holocene climate reconstruction in the Altai Mountains, northern Xinjiang, China**

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The climate in the Altai Mountains is highly sensitive to large-scale forcing factors because of its special geographic location. Based on n-alkane data of 150 samples and with a chronologic support of 15 accelerator mass spectrometry (AMS) dates from a 600-cm core at GHZ Peat, the Holocene climatic changes in the Altai Mountains were reconstructed. The reconstruction revealed a warming and drying early Holocene (~10,750~8500 cal. yr BP), a cooling and persistent dry middle Holocene (~8500~4500 cal. yr BP), and a cooling and wetting late Holocene (~4500~700 cal. yr BP). The Holocene temperature changes were primarily controlled by the summer solar radiation with a certain time lag in the early Holocene and also modulated by solar activity, and the time lag in the early Holocene was probably resulted from ice and permafrost melting. The Holocene moisture in the southern Altai Mountains was likely modulated by the North Atlantic Oscillations (NAO) or by the Atlantic Multi-centennial Oscillations (i.e., AMO-like) or by temperature, and or by any combination of the three (NAO, AMO-like, and temperature).