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Fire history in China during the Holocene and its response to the changes in environmental and anthropogenic factors

Xin Xu, Fang Li, Zhongda Lin, and Xiang Song

Fire is an intrinsic feature of terrestrial ecosystem, and a key Earth system process that strongly affects ecosystem structure and functioning , carbon and nutrient cycles, climate, air quality and society. Although local and regional paleo-fires in China have been investigated based on one or several fire-proxy records, so far China's fire history at the country level and its driving forces remain unknown. The present study, for the first time, reconstructs China's fire history based on charcoal and black carbon records at 107 sites through the Holocene (12 ka BP to the present in this study), and investigates fire historical changes and dominant drivers. Results show that fire activity over China gradually decline from the Early Holocene (12 ka BP) to the Middle Holocene (7.3 ka BP), followed by a sharp rise till the present age. The historical changes are mainly regulated by moisture change through the whole Holocene, and also affected by population growth and agriculture expansion over the past 2 ka.