

Fire and Civilization From passive adaptation to anthropogenic modification

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Wildfire, represented by forest fire, is a violent oxidation process occurring on the earth surface. Fires began soon after the appearance of terrestrial plants in the Silurian. The regime of fire has varied with climate(temperature and humidity) and vegetation since then. Human beings have altered fire activity Since the mid-Holocene, and "the deep roots" of anthropogenic factors have played a key role in modulating the Earth's surface environment long before the Industrial Revolution. Black carbon (BC), due to its chemical and microbial inertness, is an important tool for recording paleofires over geological period.

It is well accepted that the effect of temperature on fire is monotonically increasing, while humidity is a double-edged sword, On the one hand, humidity inhibits the occurrence of fire, on the other hand, humidity can promote the growth of plants, providing materials for fire. During 5-12 ka, the increase of humidity may have enhanced the regional fire activity in the Changjiang basin. the tree pollen and BC abundance also showed a good positive correlation, indicating that hydroclimate was the main driver of wildfire in this time interval. BC abundance increased rapidly, with a high fire peak lasting for 3,000 years at 5-2ka, while tree pollen content decreased rapidly. We suggests that the human-driven(deforestation) emergence of regional fire activity has decoupled from climate. After 2.0ka, the regional fire activity decreased precipitously, which was inconsistent with the results of increasing temperature and precipitation in the Changjiang basin during the same period. We suggest that human activities may play a more important role in regulating biomass burning than climate change over the past 2.0ka. In summary, based on the analysis of the existing data, it is concluded that the climate and natural fire in 5 ka have been decoupled from a single-core drive (climate) to a dual-core system (human and climate). The change of fire in 2.0 ka indicates that human activity have been overwhelmed Hydroclimate Control of Wildfire in the Changjiang basin.