

2. 树木年轮与全球变化

A regime shift between soil moisture and temperature in the 1950s over the permafrost region of Northeast China

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摘要: Permafrost is one of the essential carbon pools in the world. Due to limited studies on historical soil moisture changes and the coupling relationship between soil moisture and temperature in permafrost regions, significant uncertainty exists in the carbon loss in permafrost predicted by different models under global warming scenarios. Based on the tree-ring width chronology of *Pinus sylvestris* var. *mongolica* Litv. growing in the southern edge of the Eurasian continuous permafrost zone, we reconstructed the summer (June–September) 0–1 m soil moisture variations from 1705 to 2009, which could explain 45.6% of the variance in the observed soil moisture. Overall, local precipitation and temperature exhibited statistically significant positive feedback ($p < 0.001$) to soil moisture before the 1950s, indicating that the warm/humid climate pattern was conducive to soil moisture conservation before the Anthropocene Epoch. However, the effect of temperature on soil moisture has shifted suddenly to negative si

关键词: global warming, regime shift, soil moisture reconstruction, the Anthropocene epoch, tree rings