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Dry-wet change in the ecotone between farming and animal husbandry along the Great Wall of China between 1540 and 2019

Xiaodong Wang[1], Lijuan Chu[1], Yujia Song[2], Xiaohui Liu[3], and Ming Jiang[4]

[1]Changchun Normal University
[2]Jilin Normal University
[3]Chinese Academy of Sciences
[4]Northeast Institute of Geography and Agroecology, Chinese Academy of Sciences, Changchun 130102, China

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Abstract

The research on the periodic change of dry-wet has significance to study the regional response research of climate change. In the ecotone between agriculture and animal husbandry along the Great Wall of China,The ring width index of the Carya Cathayensis is fitted with the rain-factor index (R) calculated by the nearest Qinglong meteorological station. The R is divided into different cycles by the stepwise function fitting method. The results show that there are two dry cycles and one wet cycle from 1543 to 2019. In each dry and wet cycle, there are also different cycles, such as long (decade years), intermediate (ten years) and short cycles (several years). Drought is a greater threat to agricultural production in the region and even China. In the first dry cycle (1543-1756), 4 cycles (1633-1635: R = 30, 1636-1939: R = 26, 1640-1642: R = 9 and 1643-1645: R = 24) with low R appear continuously, the severe droughts (R < 20, no rain in a year) last 13 years. The cycles of dry-wet changes are consistent with the traditional Chinese calendar. The results can be used to make necessary preparations for effectively coping with the drought and flood.

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