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Research on the Variation Characteristics of Climatic Elements from April to September in China's Main Grain-Producing Areas

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Abstract

Climate elements are important indicators of climate change in China's main grainproducing areas during the April–September growth season and affect the growth and yield of crops. This paper combines grain concentration and geographical detector to divide the North and South regions of China's main grain production. The linear trend and Morlet wavelet transform methods are used to analyse the characteristics of climate change based on observational climate data from April to September 1981–2015. The results show that the climate in the North region is warm and dry during the growth season, whereas the climate is warm and humid in the South region. The main periods of the change in temperature in the North and South regions are 3 years, and that in precipitation is 5 years, and that in sunshine hours is 3-4 years. Changes in the climate elements in various provinces show complex, varying and regional characteristics of cold-warm and dry-wet cycles. The changes in climate elements are significant and different climatic conditions and regions have variouspossible impacts on grain production in China during the growth season. For China's agricultural-economy sustainable development and grain security, the study suggests that governments should place more emphasis on climatic elements changes during the growth season, and invest more money in disaster prevention and mitigation, especially in the main grain producing areas.

Key words:
grain-producing regions; changes in climate elements; growth season; climate trend
50 coefficient; climate tendency rate; wavelet analysis