

论文

1960-2006年闽江流域径流演变特征

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摘要:

基于闽江流域1960-2006年逐月径流、降水以及气温等资料,应用Mann-Kendall趋势分析、经验模态分解等方法,探讨流域径流演变规律及其对气象要素变化的响应特征。结果表明:①闽江流域年径流呈上升趋势,其上升主要来自非汛期径流的贡献;秋季和冬季径流始终以上升趋势为主;夏季径流20世纪90年代以来呈上升趋势,而春季径流则呈现下降趋势。②流域降水和气温均存在上升趋势,尤以气温上升为显著;径流的上升趋势比降水显著。③径流和降水变化均存在多尺度特征,降水变化周期大于径流;80年代以来,径流和降水的年代际变化振荡幅度有所减弱,而年际变化的波动幅度在加强。分析表明,闽江流域径流上升趋势较降水显著的原因,一方面是由于流域蒸发的减少和降水强度的增大;另一方面是流域下垫面特征改变等因素的影响。

关键词: 径流 Mann-Kendall 经验模态分解 闽江流域

Characteristics of Runoff Changes in the Minjiang River Basin from 1960 to 2006

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Abstract:

In this paper, the runoff change in the Minjiang River Basin is investigated and its response to main meteorological elements is explored based on the monthly runoff, precipitation and temperature data from 1960 to 2006. The adopted methods include Mann-Kendall trend analysis and empirical mode decomposition. The results are as follows: First, the annual runoff in the Minjiang River Basin is on the increase, and the runoff in the non-flood season contributes a lot to this increase. The trend of autumn and winter runoff is upward for most of the time. The runoff in summer has been on the increase while the runoff in spring on the decrease since the 1990s. Second, both precipitation and temperature of the basin increased for the study period, especially for temperature series. And the upward trend of runoff is more evident than that of precipitation. Third, multi-scale characteristics of runoff and precipitation have been detected and the periods of precipitation are longer than those of the runoff. The amplitude of decadal variability in the precipitation and runoff series has been weakened while the amplitude of inter-annual variability has been intensified since the 1980s. The paper revealed that the reason for runoff increase to be more evident than precipitation increase is that the evapotranspiration is on the decrease and precipitation intensity is on the increase in the basin. What's more, the influences of underlying surface also contribute to runoff increase.

Keywords: runoff Mann-Kendall empirical mode decomposition Minjiang River Basin

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