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基于标准化降水蒸散指数的华南干旱趋势研究(PDF)

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Title: Study on drought trend in south China based on standardized precipitation evapotranspiration index

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摘要: 最近几年华南地区干旱频发,为探讨该地区的干旱趋势,用标准化降水蒸散指数(SPEI)和1961-2010年华南地区具有代表性的50个站点的月降水及月平均气温资料,分析了该地区近50年来的干旱趋势、干旱空间分布、极端干旱事件发生频次和干旱持续时间。结果表明,华南地区普遍存在干旱事实,最近10年是干旱最严重的10年,Mann-Kendall检验表明该地区平均SPEI指数从1998年开始突变;干旱化最严重的区域是海南岛、广西南部和西部地区,广东的干旱化趋势最轻。20世纪70年代干旱和极端干旱事件较少,其后明显增多,干旱持续时间也有所延长。由于该地区降水呈现弱增加趋势而温度升高显著,因此推测温度升高导致蒸散增加可能是华南地区干旱化的主要原因。另外,降水频次的减少和集中也是导致近来极端干旱事件增多的原因之一。SPEI指数较好地体现了气候变暖导致的干旱化趋势。

Abstract: In recent years, drought in south China occurred frequently. In order to investigate the trend of drought in this region, the standardized precipitation evapotranspiration index (SPEI) and monthly precipitation and average temperature data from the representative 50 sites in South China during 1961-2010 were used to analyze the drought trend, the space distribution of extreme drought events, the drought occurrence frequency and drought duration in the region during nearly 50 years. The results show that south China is meeting with a widespread drought trend. The most severe drought has occurred in the last 10 years. Based on the method of Mann-Kendall test, it is known that the average SPEI index of the region mutated from 1998. The most severe drought area is the southern and western parts of Guangxi Province and Hainan Island, while the

drought trend in Guangdong Province is the lightest. The extreme drought event occurred scarcely during the 1970s, and extreme drought events significantly increase subsequently and the drought duration extended. Significant temperature rise and weak increase in precipitation in this region resulting in the increase in potential evapotranspiration, which is probably the main reason of the drought trend in South China. The fact indicates that SPEI is a good drought trend indicator under climate warming. In addition, the high frequency of occurrence of extreme drought events is partly attributed to the decreased frequency of precipitation events and the rainfall concentration in recent years.

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