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Long-term changes in runoff from a small agricultural catchment

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River runoff is an important indicator of environmental changes, which usually include climate and/or land use changes, and is also the basis of catchment water management. This study presents results of monitoring and analysis of 48-year precipitation and runoff from a small agricultural catchment located in central Poland. No land use changes in that period have been reported. Mean monthly distributions of precipitation and runoff for the long-term period showed that July was the wettest month in respect of precipitation and a drier one in respect of runoff, averaging 12.9% and 5.2% of their annual values, respectively. To evaluate the trend of three annual hydrometeorological parameters, i.e. precipitation, runoff and runoff coefficient, the Mann-Kendall test was applied. It indicated no trend in respect of precipitation, and decreasing trends of runoff and runoff coefficient at a 95% level of significance. Linear approximation of the annual runoff values indicated a decrease in runoff of ca. 1.2 mm per year for the analysed period. A few other functions were also used for better approximation of runoff data.

Keywords:

climate change; Poland; runoff variability; small watershed; trend analysis

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