

Effect of climate change on flood events as a major driver of nutrient transport in western Japan

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Abstract This research aims to assess the effect of climate change on flood events as a major driver of nutrient discharge. It was found that small-scale flood events have decreased and extreme flood events have increased in western Japan. In addition, the frequency of discharge drought years decreased from the 1980s to the 2000s. The results imply that the runoff trend may have caused a flow regime shift. Accordingly, the capability for nutrient transportation during baseflow conditions has decreased. While the amount of nutrients can accumulate within the catchment during drought periods, large amounts of nutrients can be transported in the first flood event. It is like the first flush phenomenon in urban hydrology. It was found that the mean N:P ratio of the study catchment in Japan had increased in the recent decade. Although change of human activities may be one of the reasons, it is suggested that flow regime shift due to climate change may be an important driver.

Key words nutrient transport; flood; extreme event; drought; SWAT model