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Effects of extreme rainstorms on the export of diffuse pollution from an agricultural watershed in eastern China

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Abstract Agriculture is an important contributor to diffuse pollution in the aquatic environment system. The exact transfer of nitrogen (N) and phosphorus (P) in an agriculturally dominated area is still poorly understood. Export of pollutants shows significant spatial and temporal variation and the relevant factors are complex and nonlinear in nature. There has been a dramatic increase of synthetic fertilizer usage in southern China during recent decades due to decreasing farmland and increasing food demand. Massive N and P fertilizer application has led to many environmental problems, especially eutrophication. Research has shown that extreme rainstorms will increase in frequency with climate change. The objective of this study is to examine the diffuse agricultural pollution transfer at the watershed-scale and field-scale through event-based, on-site observation and sampling. Seven years of experiments carried out in Meilin watershed demonstrate the export of significant quantities of nutrients during high intensity rainstorms. Based on detailed field experiments, the N and P transfer in different seasons and land covers is described.

Key words extreme rainstorms; nitrogen; phosphorus; agriculture; field experiment; Meilin watershed, China