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Optimal watershed management practices for the reduction of future non-point pollutants loads

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ABSTRACT

From a water quality perspective, adaptation to climate change means reducing pollutants (total phosphorus in this study) increased by climate change to the current state. In this study, best management practices (BMPs) are presented to maximize the cost-effective pollutant reduction effect for adapting to climate change. Multi-purpose optimization by direct driving of soil water assessment tool (SWAT) requires unrealistic simulation time. Therefore, in this study, after setting various BMPs scenarios based on the identification of BMPs applicable for each land use, TP reduction efficiency, and cost required for each scenario were databased. Using this database, multi-purpose optimization was performed without direct simulation of SWAT. The method proposed in this study significantly reduced the number of SWAT simulations and climate change adaptation in the upper reaches of Namgang Dam in Korea was possible with sufficient investigations with only 18 SWAT simulation results. The finally derived BMPs plans was displayed on a map so that the exact location of the BMPs facilities could be identified.

Keywords: Best management practice; Climate change; Multi-objective optimization; SWAT; Total phosphorus

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