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# Development of EMC-based empirical model for estimating spatial distribution of pollutant loads

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**ABSTRACT**

In this paper, a new and integrated approach to easily calculate pollutant loads from agricultural watersheds was suggested and verified. The basic concepts of this empirical tool were based on an assumption that variations in event mean concentrations (EMCs) of pollutants from a given agricultural watershed during rainstorms were only attribuTable to the rainfall pattern. Fifty one sets of EMC values were obtained from nine different watersheds, and these data were used to develop prediction tools for the EMCs in rainfall runoff. The results of statistical tests of these formulas showed that they were fairly good in predicting actual EMC values of some parameters, and useful in terms of calculating pollutant loads for any rainfall event time span such as daily, weekly, monthly, and yearly. As part of this study, we were able to examine the field applicability of the empirical model. In an effort to improve the water quality of a reservoir, all water were drained and followed by a cleanup of the sediments. Later, the rainfall water storage and the change in water level began. The predicted values of the chemical oxygen demand (COD) corresponded well with observed values. The predicted total nitrogen (TN) moderately matched the observed values. However, there was a great difference in suspended solid (SS) and total phosphorus (TP) between the two parts. Finally, we concluded that the EMC-based empirical model could be considered as a simpler, more feasible, and useful solution in evaluating timely distribution of nonpoint pollution loads in agricultural and forested watersheds in constructed and other complicated watershed models.

*Keywords:* EMC; Empirical model; Non-point source pollution; Spatial distribution

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