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Watershed-scale modeling to estimate delivery ratio of pollutant loads to support TMDL application in Korea

Sae Bom Lee[a], Chun Gyeong Yoon[a]*, Kwang Wook Jung[b], Jae Ho Jang[a], Doug Hee Rhew[c]

[a]*Department of Environmental Science, Konkuk University, Seoul, Korea*
email: chunyoon@konkuk.ac.kr
[b]*Research Division, Korea Water Environment Research Institute, Seoul, Korea*
[c]*Water Pollution Cap System Research Division, National Institute of Environmental Research, Incheon, Korea*

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ABSTRACT

The delivery ratio of pollutant loads can be defined as the ratio of the discharged pollutant load delivered to the point of interest divided by the mass of pollutants generated at the source. Assessing delivery ratios is important to watershed management planning for Total maximum daily load because delivery ratios can indicate the characteristic pollutants of a watershed. To estimate exact delivery ratios, monitoring data of water quality and flow for the duration of flow are required. However, time, cost, and labor constraints mean that such data sets are often incomplete, and additional monitoring efforts are needed to supplement data. Watershed-scale models that are properly calibrated and verified can provide estimates of water flow and quality to fill gaps in data. In this study, model outputs were used to calculate the delivery ratio. The results demonstrate the usefulness of the watershed-model method for estimating the delivery ratio. Construction of a nationwide watershed model for South Korea and the model outputs for target water quality station will be useful for local governments. The watershed model used in this study adequately simulated watershed characteristics and is recommended for use in estimating delivery ratios to support TMDL management.

Keywords: Delivery ratio; TMDL; Watershed-model

* Corresponding author.