



Performance evaluation of TMDLs in upstream Seomjin River Basin using LOAD ESTimator model

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Received 30 November 2021; Accepted 30 March 2022

ABSTRACT

In this study, target water quality achievements, water quality improvement, and causes of exceeding the target water quality were analyzed. Water quality and flow monitoring data of the unit basins of the Seomjin River obtained by implementing total maximum daily loads (TMDLs) given by the Korean Ministry of Environment were used and simulated in the LOAD ESTimator (LOADEST) model. Pollutant loads were simulated using regression equations of the LOADEST model. The simulation results exhibited appropriate ranges for statistical variates with the measured values, indicating that the LOADEST model can simulate pollutant loads and can effectively analyze water quality. While evaluating the target water quality in TMDLs using the measured loads and those predicted by the LOADEST model, biochemical oxygen demand did not exceed the target water quality (excess rate: 50%) at the target points; however, the total phosphorus exceeded permissible limits at some target points. The excess rate was higher in the simulated values than in the measured values and under high-flow conditions than under low-flow conditions. Further, TMDL management performance was quantitatively evaluated by applying the LOADEST model for continuous and efficient water quality management measures and to implement water quality management policies in the future.

Keywords: Total maximum daily loads; Pollutant loads; Regression model; LOAD ESTimator

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