

SCCWRP #568

## **Evaluating the Effectiveness of Best Management Practices Using Dynamic Modeling**

Drew Ackerman and Eric D. Stein

### **ABSTRACT**

Structural best management practices “BMPs” have become a tool for stormwater managers to achieve water quality improvement and regulatory compliance. Existing empirical evaluation of BMP performance is valuable, but has limited applicability to predict BMP performance over extended durations under a variety of storm types. This study applies a dynamic model to simulate BMP performance over a 10-year period. The BMP model used hourly output from a calibrated and validated land-use model to evaluate two BMP types: a retention facility and a flow-through swale. The model evaluated each BMP alone and in series targeting volume, total suspended solids, and total copper. Effectiveness was based on load reduction, event mean concentrations, and frequency of exceedence of relevant water quality standards. The model predicted over 60% removal of solids and copper over most conditions; however, effectiveness was reduced during large storms and wet years. Although performance was similar based on load reduction and water quality standard exceedence, the latter was most sensitive to storm size. This study demonstrates that BMP modeling can help managers understand expected BMP performance over a range of storms, time periods, and design parameters, and, perhaps more significantly, evaluate BMPs in series.

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