

Utilization of response surface methodology and regression model in optimizing bioretention performance

ABSTRACT

In recent years, the popularity of optimization of bioretention systems through statistical experimental design had increased due to rapid urbanization, which directly impacted the water quality and quantity of stormwater runoff from an increasing area of impervious surface. Experimental design is necessary for developing interaction between two or more responses with various affecting factors. Due to this significant possibility of combining several variables in optimizing experimentation results, statistical analysis is essential to observe the process and optimize the responses data accurately. Response Surface Methodology (RSM) is the most commonly used statistical analysis method. There is a wide range of RSM applications from science to industrial practice. The RSM method can handle multiple factors and responses in a short amount of time compared to conventional analysis. Hence, this paper highlights the significance of RSM in optimizing pollutants rate and regulation effects in bioretention cells. From the analytical literature observation, optimization of improved and conventional bioretention system shows positive interaction effect and responses value through various bioretention design factors manipulation. The validity of the regression model also shows adequate results and wellmatched between experimental and statistical predicted values.