



SWMM Model Limitations Report

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The SWMM models were built with specific assumed criteria driven by the lack of stormwater infrastructure data. Naturally, these assumptions increase the degree of uncertainty in the model and curtail its potential applications. This document describes key assumed considerations within the Hydrologic and Hydraulic aspects of the models.

Hydrologic Component

- The estimation of the Curve Number (CN) was based on the Land Cover Use (LCU) data sourced from the *Conterminous United States Land Cover Projections* study (<https://www.sciencebase.gov/catalog/item/5b96c2f9e4b0702d0e826f6d>). This dataset has a spatial resolution of 250 meters (250-m pixels), which introduces inherent uncertainty into the CN estimation process. To enhance the accuracy of CN estimation, potential strategies could include model calibration or the derivation of the LCU from the classification of high-resolution orthophotos.

Hydraulic Component

- SWMM models were built based on a simplified drainage network. This new network is confirmed by the main pipe of each sub-watershed, whose diameter was increased to encompass the cumulative diameters of all pipes responsible for collecting runoff generated within the respective sub-watershed. Therefore, the model does not provide information on the water depth in the whole manholes of the actual drainage network.
- The diameter of the main pipes employed in the model's construction surpasses the real. Then, the results do not represent the actual hydraulic behavior of the water in the pipes.
- The information provided for the nodes did not include the bottom elevation of the pipe inside the manholes. The absence of this information led to the development of a methodology based on the distribution of drainage networks that would allow assuming these elevations. In this sense, the water depths shown in the model and used for generating the flood maps could present variations. Therefore, the water depths depicted in the models (and the flood maps) may diverge from actual conditions in some scenarios.
- The information provided did not include the elevations of the pipeline discharges, so this was assumed. Consequently, the behavior of the water inside the pipe could differ from reality.

One of the main limitations of the model was that the calibration could not be assessed due to the absence of observed flow data at the watershed's outfall. This impediment limits the possibility of using this study results to design or implement stormwater ordinances. However, it is essential to highlight that the SWMM models allow to quantify the amount of runoff generated in the studied area, and the results herein may be used as a first approach to understanding the order of magnitude of the sea level rise on the stormwater system.