

## SWMM-based Urban Storm Sewer System Modeling

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**Keywords:** storm sewer system, modeling, SWMM (Storm Water Management Model), equivalent pipe, Nash-Sutcliffe efficiency

**Abstract.** SWMM modeling plays an important role in the urban drainage system management. The paper depicts several modeling steps, including model parameters, dynamic wave options, CFL condition and equivalent pipe and model evaluation. For dynamic wave options, combination of "ignore" and "both" is relatively better than others. Impact of friction equation is very tiny. Especially, "Froude No." is recommended not to use, while "slope" can make a good result. For inertial terms, "ignore" is considered as the best option. Equivalent pipe is used to deal with SWMM numerical instability, and coefficient of correlation, Nash-Sutcliffe efficiency are used to assess modeling performance.

### Introduction

Simulation modelling plays an important role in the urban drainage system management. It is aimed at understanding and predicting the behaviour of the systems so that effective solutions to structural and operational problems can be tried out and evaluated. So simulation modeling is popular with cities all over the world. But how to build a successful urban storm sewer modeling is still a concern. In this context, it aims to depict SWMM modeling method using a case study.

The EPA Storm Water Management Model (SWMM) is a world famous dynamic rainfall-runoff simulation model used for single event or long-term (continuous) simulation of runoff quantity and quality from primarily urban areas<sup>[1]</sup>. It is used as modeling platform in the paper.

### Case study

It consists of 158 nodes, 157 links, 28 sub-catchments and 3 rain gauges in the current project. The total area of the catchment is about 1462 hectare. Backwater effect from tide is very strong, and should be taken into consideration. So dynamic wave method is selected as pipe flow routing option in the project.

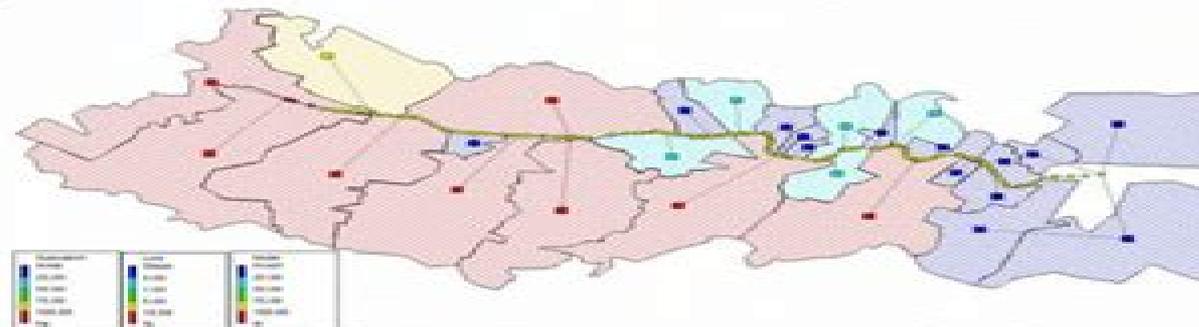


Fig.1 SWMM map of the case study

# Urban Storm Modeling And Stimulation

**Jiyuan Zhang**



## **Urban Storm Modeling And Stimulation:**

The book delves into Urban Storm Modeling And Stimulation. Urban Storm Modeling And Stimulation is an essential topic that needs to be grasped by everyone, from students and scholars to the general public. The book will furnish comprehensive and in-depth insights into Urban Storm Modeling And Stimulation, encompassing both the fundamentals and more intricate discussions.

1. The book is structured into several chapters, namely:

- Chapter 1: Introduction to Urban Storm Modeling And Stimulation
- Chapter 2: Essential Elements of Urban Storm Modeling And Stimulation
- Chapter 3: Urban Storm Modeling And Stimulation in Everyday Life
- Chapter 4: Urban Storm Modeling And Stimulation in Specific Contexts
- Chapter 5: Conclusion

2. In chapter 1, this book will provide an overview of Urban Storm Modeling And Stimulation. The first chapter will explore what Urban Storm Modeling And Stimulation is, why Urban Storm Modeling And Stimulation is vital, and how to effectively learn about Urban Storm Modeling And Stimulation.

3. In chapter 2, this book will delve into the foundational concepts of Urban Storm Modeling And Stimulation. This chapter will elucidate the essential principles that need to be understood to grasp Urban Storm Modeling And Stimulation in its entirety.

4. In chapter 3, the author will examine the practical applications of Urban Storm Modeling And Stimulation in daily life. This chapter will showcase real-world examples of how Urban Storm Modeling And Stimulation can be effectively utilized in everyday scenarios.

5. In chapter 4, the author will scrutinize the relevance of Urban Storm Modeling And Stimulation in specific contexts. The fourth chapter will explore how Urban Storm Modeling And Stimulation is applied in specialized fields, such as education, business, and technology.

6. In chapter 5, the author will draw a conclusion about Urban Storm Modeling And Stimulation. The final chapter will summarize the key points that have been discussed throughout the book.

The book is crafted in an easy-to-understand language and is complemented by engaging illustrations. It is highly recommended for anyone seeking to gain a comprehensive understanding of Urban Storm Modeling And Stimulation.

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