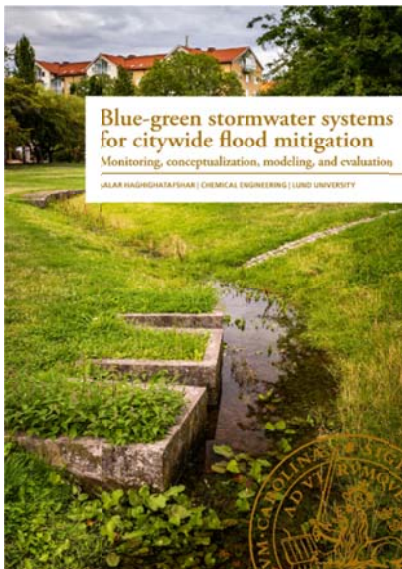


Blue-green stormwater systems for citywide flood mitigation - Monitoring, conceptualization, modeling, and evaluation

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DOCTORAL DISSERTATION

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To be defended at Lecture Hall K:C at the Centre for Chemistry and Chemical Engineering,
Naturvetarvägen 14, Lund, on **Friday, October 25, 2019, 9:15 AM.**
Faculty opponent: Professor Wolfgang Rauch, Department of Infrastructure Engineering,
University of Innsbruck



Implementation of blue-green stormwater systems in dense cities would, to some extent, relieve the hydraulic overload of urban drainage networks. However, the method for identifying urban areas in which the implementation of blue-green stormwater systems would have a larger effect hydraulically on the existing sewer network is unestablished. Thus, the general aim of this thesis was to develop a method for studying the interactions between piped drainage networks and blue-green stormwater systems on city-scale, performed in four steps:

- An existing blue-green rainwater system—i.e. the Eco-city of Augustenborg in Malmö—was examined to understand how such systems work, locally and regarding the surrounding neighborhoods.
 - A simple conceptual model for blue-green stormwater systems was proposed.
 - Based on the proposed concept, a fast, easy-to-use, and robust modeling tool was developed, making it possible to simulate the interaction between blue-green stormwater systems and sewer networks.
 - The modeling tool was supplemented with a hydroeconomic optimization algorithm and evaluated on the city-scale to identify the most effective site and size for blue-green stormwater systems throughout the catchment of the sewer network.
- The developed method and toolchain constitute a new platform for increasing our understanding of complex urban drainage networks. This platform is also a starting point for the development of a more reliable tool for the initial screening of urban catchments to identify urban areas in which it is hydraulically and economically efficient to construct neighborhood-scale blue-green stormwater systems.

Welcome!
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via Karin Jönsson