

# Evaluation of flood management in Malmö, Sweden

A green stormwater system constructed during the 90s reduced flood damage during an extreme rainfall event 15 years later

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**Proof that the new stormwater system protects against flooding**



**Shows that a SUDS can be efficient also during extreme rainfall**



**Quantifies the effects of the retention and detention processes in the system (infiltration, storage etc.)**

## Challenge

The area of Augustenborg in Malmö, southern Sweden, was retrofitted with a green open stormwater system in the late 90s. When a major rainstorm hit the city of Malmö in August 2014, Augustenborg was less affected by flood damage than other nearby areas.

Ever since the stormwater system in Augustenborg was reconstructed, it had been assumed that the system helps protect against flooding. However, this had not been proven, and it was also unknown if the new system was efficient for extreme rainfall events with a 100-year or higher return period.

## Solution

The stormwater system in Augustenborg – a Sustainable Urban Drainage System (SUDS) - consists of open canals, swales, ponds and green roofs as well as adapted levelling of green areas to ensure controlled flooding.

A model of the system was set up in MIKE FLOOD using MIKE URBAN and MIKE 21, including the rain on grid and infiltration modules in MIKE 21, to enable correct estimation of stormwater infiltration in green areas. Two scenarios were created – one for the current stormwater system and one for the former system. This methodology allowed us to evaluate the flood protection efficiency of the new open stormwater system compared to the old pipe-based system. Results showed that the retrofitted green stormwater system would result in a substantially lower risk of flood damage compared to the former traditional system.

*'Being a PhD student at Lund University at the time this research was conducted, I had the opportunity to closely collaborate with DHI and their experts within the field of urban hydrology and urban drainage modelling. This project, beside its interesting results, was also a very fruitful partnership as it led to more collaborations in research and innovation between DHI and Lund University in the following years. In addition to DHI's robust and handy modelling software, I found the collaborating professionals of the company very smart, helpful, ambitious and with high problem-solving capacity.'*

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