



## Local Effects of Global Climate Change on the Urban Drainage System of Hamburg

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### ABSTRACT

The HAMBURG WATER group owns and operates a sewer network with a total length of more than 5,500 km. With regard to the predicted climate changes, increasing attention is focused on the effects of possible changes in precipitation patterns on the present sewer infrastructure.

The primary objective of the studies presented in this paper is an estimation of the hydraulic impacts of climate change on the Hamburg drainage system. Based on the regional climate model REMO, simulated rainfalls were compared and validated with long-term precipitation measurements. Then, the hydraulic effects on the combined inner city sewer network of Hamburg and on several separate sewer catchments have been analyzed based on simulated long-term rainfall series for the period of 2000 to 2100. Simulation results show a significant increase in combined sewer overflows by 50 % as well as an increase in surcharges of storm sewer manholes. However, there is still a substantial amount of uncertainty resulting from model uncertainty and unknown development of future greenhouse gas emissions.

So far, there seems to be no sound basis for the implementation of an overall climate factor for sewer dimensioning for the Hamburg region. Nevertheless, possible effects of climate change should be taken into account within the planning process for major sewer extensions or modifications.

### KEYWORDS

Climate change, Hamburg, REMO, urban drainage system