



## **Urbanization versus climate change: impact analysis on the river hydrology of the Grote Nete catchment in Belgium**

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### **ABSTRACT**

In this article it is investigated if the impact of urban fluxes on the river system of the Grote Nete catchment (Belgium) is expected to change significantly due to climate change. First the impact of Waste Water Treatment Plant (WWTP) and Combined Sewer Overflow (CSO) outflows on the river system for the current climatic conditions is determined by simulating the urban fluxes as point sources in a detailed, hydrodynamic river model and comparing this to the result of the simulation that does not include these urban point sources. The modelled discharges in the river are analysed for high flow extremes. The extreme value analysis is then repeated for different climate change scenarios both including and excluding urban fluxes as point sources.

For this specific case study it is shown that the change in the predicted 10-year return period hourly peak flow discharge due to climate change under the urbanized condition (-14% to +45%) is in the same order of magnitude as the change that can be observed due to the urbanization (+5% to +20%). Different climate change scenarios do not change the impact of urbanization except for the high summer scenario where the impact of urbanization on the river system is increased. These results form the basis of the design of adaptive measures that are currently being considered for urban drainage systems.

### **KEYWORDS**

Climate Change, Combined Sewer Overflow (CSO), extreme value analysis, river modelling, urbanization, Waste Water Treatment Plant (WWTP)