

MIGR-ModEm

Modelling micropollutant emissions of sewers systems to surface waters



PROJECT

Inspiration

At present, complying with the EU Water Framework Directive (EU WFD) is the primary concern of the water sector in Europe. Emissions from urban waste water systems (drainage networks and waste water treatment plants) have a significant impact on the quality of surface waters. For this reason, numerous urban waste water system infrastructure, such as waste water treatment plants and combined sewer overflow (CSO) structures, are currently being constructed or updated.

So far, the measures completed have focused mainly on the construction and updating of waste water treatment plants. The growing expansion of area-wide state-of-the-art waste water treatment means that a rising share of emissions entering surface waters now comes from sewer systems. In this context, the assessment of the performance and emissions of CSO structures, including a cost benefit analysis, is of increasing concern for the sustainable management of surface waters.

Current software tools used for hydraulic and pollution load simulation in sewer systems consider the treatment processes in CSO structures in a very simplified way or not at all. Consequently, simulation results do not reflect the dynamics of relevant pollutant flows under real conditions. In fact, many detailed models have been developed to simulate the treatment performance of specific structures, but they are not easily manageable and hard to integrate within common simulation programs for drainage systems that mimic the long term performance of complete sewer systems as well as single structures at emission points to surface waters.

Innovation

The MIGR-ModEm project aims to tackle this challenge by developing a new, optimised method of modelling pollutant flows. Researchers will begin by summarising the requirements of modelling approaches for the detailed modelling of urban sewer system emissions with a special focus on micropollutants. They will then characterise existing modelling approaches, assessing their applicability based on specific requirements. Finally, they will select and evaluate the applicability of available monitoring data for the specification of emission characteristics as well as for the calibration and validation of selected modelling approaches.

Impact

The MIGR-ModEm project will contribute to the development of a detailed and reliable approach for modelling pollutant flows in structures at sewer system emission points. This will enhance the economic and resource efficient dimensioning of structures and foster the application of innovative treatment structures, something not currently possible as specific treatment capabilities are not taken into account in detail in existing simulation tools. The project will support the integrated planning, modelling and operation of urban waste water systems, while the updated simulation tools will provide more authoritative information for the sustainable management of surface waters.

Financial Support

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