

2022-10-31

Utveckling, kvalitet och miljö

Ville Tanskanen

Gryaab AB, Box 8984, 402 74 Göteborg, [031-64 74 00](tel:031-647400), gryaab.se

Masters thesis proposal

Proposed name

Water balance - Case study on Gothenburg and another Swedish city

Background

Future challenges for wastewater treatment are strongly connected to climate change through changes in local rainfall intensity and duration. Challenges proposed for a city spread wide, affecting the water and wastewater systems. Responsibility for mitigation and adaptation is divided among a multitude of organizations inside a city, such as the water utilities, city development and traffic planning. Multiplicity of stakeholders highlight the need of deeper understanding of underlying processes.

Gryaab AB operates the Rya wastewater treatment plant (WWTP) of Gothenburg region. Wastewater treatment is facing stricter discharge standards and strongly fluctuating inflows enhanced by climate change. As price and efficiency of wastewater treatment strongly correlates with dilution of influent, understanding pathways of water through built infrastructure is crucial for designing sustainable wastewater treatment of the future.

Aim

This thesis should focus on answer some of the following:

- Why work with water balance?
 - How can case cities utilize water balance in further work across organizational boundaries?
 - Which insights can be gained from water balances for studied cities?
- How can water balance be optimized to prepare for resource scarcity?
 - How can different flow fractions be characterized?

- Which reuse and recycling potential is available?
- What are the main pathways and flows in the technical water systems of the case city?
 - Which processes can be recognized at the boundaries of the water balance?

Approach

The thesis should begin with a literature study. The literature study should review existing calculation models applicable for producing a water balance. Main part of thesis is to produce a water balance model of case cities applying local conditions and data.

The product, up-to-date water balance is to be analyzed to pinpoint possibilities for optimization. Further on water balance is to be used to recognize future risks and possibilities for mitigating these risks for studied water and wastewater systems. Finally key differences between case cities are to be discussed.

Input data for the study will be collected in collaboration with water and wastewater utilities in case cities from existing databases. A reference group within cluster VA-teknik Södra is made available to support thesis work.

Contact

Ville Tanskanen, Development Engineer at Gryaab AB (ville.tanskanen@gryaab.se)