BEPROACT

DATA DRIVEN ASSET MANAGEMENT

Interreg Co-funded by the European Union
North-West Europe

The Flanders Environment Agency (VMM) wants to use the open data water quality parameters gathered by multiparameter sensors, using artificial intelligence and machine learning methodologies, to detect and predict anomalies in the water quality, to pinpoint the causes, to prevent environmental damage and to optimize the lifetime of the sensors.

OUR CHALLENGE



VMM has **200 multiparameter sensors** in rivers and water courses all over Flanders.

These sensors currently measure:

- » pH
- » temperature
- » oxygen
- » turbidity
- » conductivity

All **measurements** are done **every 15 minutes**, and sent to VMM servers every hour. So we have a **massive amount of sensor data** stored on our servers. We can analyse these data on our computers.
In the **near future** we will purchase and **install 100 extra multiparameter sensors.**

OUR GOALS

Using a **dynamic alert system** and **model interventions** in the **sewer or watertreatment system** to monitor and **improve water quality** of surfacewater and **trace back the polluting source**.

- » detect and predict anomalies in the water quality
- » pinpoint the causes
- » prevent environmental damage
- » optimize the lifetime of the sensors

OUR CASES

CASE 1: Early response actions in case of pollution e.g. adding oxygen to allow fish to survive



Not only can we use analysis tools, but also through machine learning and artificial intelligence, we can recognize patterns in water quality, and we can predict water quality. If we see a certain pattern, it can be the precursor of e.g. an oxygen deficiency, and we can pro-act and activate oxygen blowers.

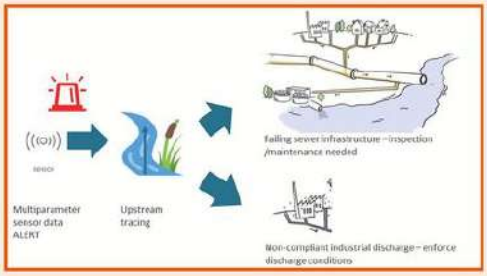
CASE 2: Optimizing lifetime of waterquality sensors.

Use machine learning to detect malfunction and sensor degradation.

CASE 3: Use big data of historic water quality measurements in combination with real time monitoring of pollution levels to develop and implement a dynamic alert model for failures in sewer and water treatment systems and backtrace polluting sources.

If certain parameters exceed treshold values, we can perform upstream tracing. In case of malfunctioning of the sewer infrastructure we can alert the sewer managers to investigate the problem.

In case of non-compliant industrial discharge we can enforce the business/enterprise to comply to the discharge conditions.



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