

SWI related projects (Updated May 2013)

The Radarproject

Ålborg University and Krüger in cooperation with a.o. Hvidovre, Holstebro, Odense, Aalborg og Århus forsyninger have started a server which on a running basis shows rain intensity predictions based on local radars. It also generates flow predictions for strategic points in the sewer system, based on the WaterAspects model.

New interpretation methods for the radar signals are developed.

Period: 2009-2010

Website: <http://www.kruger.dk/da/Artikel/16872.htm>

Contact Person: Troels Sander, Krüger. tsp@kruger.dk

Integrated monitoring and control of wastewater systems (Samstyring. Integreret overvågning og styring af spildevandssystemer – fra kilde til recipient) An on-going project on integrated control i 'Århus Vand'. The project makes part of a larger project that aims at improving the water quality in Brabrand Lake and Århus 'river' (å) with a budget of 350 mill. DKK.

The project will comprise new retention basins, disinfection systems and realtime control with stormwater mode at the wastewater treatment plants.

New development and testing of a model based control module for the sewer system. This is done by DHI and Krüger. It is being implemented in full scale. A warning system for the water quality in the harbour makes part of the system.

The project is used as demonstration in the EU supported project (www.WSStp.eu and PREPARED, see below).

Period: 2009-2011

Website:

Contact Person: Lene Bassø, Aarhus Vand

The Kolding Project (Kolding projektet)

Development of datacollection and presentaion in a new graphical user interface (GUI). Its possible to follow the pumping and the filling and emptying of basins to better exploit the existing sewer and basin volumes. The frequency of CSOs from a central overflow in Kolding has been reduced significantly.

Period: 2009

Website:

Contact Person. MG@kruger.dk

Intelligent Handling of Wastewater (Intelligent spildevandshåndtering (ISH))

Coupling of an integrated deterministic model of the sewer system and a wastewater treatment plant model (MikeUrban and West). Rambøll and Envidan are consultants for Lynettefællesskabet. Many possible scenarios have been reduced to a short list of 7 scenarios. By the help of model simulations the effects can be evaluated along with economy. Stormwater control based on flowpredictions turns out to be most cost efficient. ISH will continue into phase 4 in 2012.

All 8 municipalities that own Lynettefællesskabet are participants, and the plan is to develop the best coordinated strategies for the whole catchment area.

Period: 2009-2013

Webpage: <http://www.ramboll.dk/projects/viewproject?projectId=A14377F6-1862-4C0A-85AD-0C94AF9320D1>

Contact: Henrik Dehn, Københavns Energi, hdeh@ke.dk

The Capacity Project (Kapacitetsprojektet)

Spildevandscenter Avedøre is in the process of upgrading the hydraulic capacity of the wastewater treatment plant to 20.000 m³/hour. In the autumn of 2011 4 new influent pumps are installed. Later some flow limitations and new effluent pumps will be installed. A new outlet pipe to the sea of 1100 meters was installed in the summer of 2011. This will ensure that all water (treated and bypass) is diverted to a greater depth away from the cost.

At the same time some flow limitations in the transmission net from the municipalities to the treatment plant will be tried eliminated. Model simulations of different rain scenarios to analyse the bottle necks etc. is part of the project.

Periode: 2010-2012

Website: <http://www.spildevandscenter.dk/kapacitetsprojekt>

Kontakt Person: Helmer Petersen , Spildevandscenter Avedøre , hmp@spvand.dk

Radargruppe

A group of utilities in the Copenhagen region has established a cooperation forum to coordinate and improve the use of local radars.

Period: Running

Webpage:

Contact: Jesper Thyme, Hvidovre Forsyning.

METSAM

The utilities of Copenhagen wishes to demonstrate on-line control using key-points in parts of the two catchments to wwtp Lynetten and Avedøre respectively. These two catchments are dominantly combined vs. separate.

Krüger will develop a control platform based on 'Dynamic Overflow Risk Assessment' DORA. The central parts for this are developed in SWI.

Metsam is continuing in 2013 with on-line test in SCA's catchment area and modelling to prove the effect of DORA.

Period: 2011-12

Website: <http://www.udviklingssamarbejdet.dk/projekter/metsam>

Contact: Dines Thornberg, Udviklingssamarbejdet, dt@spvand.dk

Model-predictive control of urban water systems under uncertainty (MOPSUS) -

This industrial postdoc project will improve the usage of Model Predictive Control tools for optimization of integrated urban water systems by including methods for uncertainty assessment. The project will utilize tools which are developed within the SWI project. The project is carried out in collaboration between DTU Environment and Krüger A/S and it is co-financed by the Danish National Advanced Technology Foundation

Period April 2012 – March 2014

Website: http://hoejteknologifonden.dk/projektgalleri/4_januar_2012/renere_vand_med_computerstyrede_kloakker/

Contact: Luca Vezzaro, DTU Environment (luve@env.dtu.dk)

OMOVAST

A 2-year development and demonstration project involving Krüger, DMI, and Udviklingssamarbejdet supported by MUDP. The aim is to develop a more accurate warning of heavy rain and risk of flooding for the SCA and Lynette catchments. Basis is DMI detailed precipitation forecasts for short time scales, ie. 6 hours ahead, supplemented by a series of 25 different forecasts for the same weather situation to illuminate the forecast uncertainty and the development of a longer time horizon up to 48 hours.

DMI forecast data will be linked to some hydrological model of the sewers. (best detail level is to be decided)

It is hoped and expected that the project leads to a better warning system, which can subsequently be used by decision makers in local authorities, including when implementing various emergency response associated with a risk of flooding.

Period: 2013-15

Website:

Contact: Frank Agerskov, Krüger or Helmer Petersen, SCA.(hmp@spvand.dk)

Overflows from combined sewers – How to measure them – why?

This project is cofunded by the Foundation for Development of Technology in the Danish Water Sector Water. The overall aim of this project is to gain knowledge on the water quality of combined sewer overflows, how to measure, what to measure and so on. The output of this project will be a guideline on how to monitor and water to monitor and a dataset on water quality of combined sewer overflows.

Period: 1/1-2012 – 1/12-2014

Contact: Lene Bassø, Aarhus Vand (lba@aarhusvand.dk)

International projects

Switch

From diverse ad hoc access to integrated action within the urban watercycle.

Learning alliances are created I 10 cities. No Danish participation.

Period: 2007-?

Webpage: <http://www.switchurbanwater.eu/index.php>

Contact: ?

Prepared

Prepared is a large project supported by the EU with 55 partners from 14 countries.

The overall purpose is to prepare the water sector for the consequences of the climate changes.

Major subjects are

- Perception of uncertainty
- Risk management
- Adaptation for the whole water cycle
- Monitoring, sensors and modelling

One of the more concrete ideas, according to Mr. Lynggaard, is to move from control based relatively few rules to a genuine modelbased control. A MikeUrban Engine will supply data for defined points in the sewer system in a real-time simulation.

In Denmark the above mentioned 'Integrated monitoring and control of wastewater systems' will act as one of many demonstration projects in PREPARED. DHI has an important role in the project as assistant coordinator and Krüger is participant.

Period: 2010-2014

Webpage: <http://www.prepared-fp7.eu/prepared-home>

Contact: Anders Lynggaard, DHI, alj@dhigroup.com

BALTRAD+

Webpage: <http://baltrad.eu/>

Hydrocast

The objective of the project is to establish and test a general framework for hydrological forecasting that combines different data sources with meteorological and hydrological modeling. Key scientific challenges addressed by the project include: (i) integration of on-line measurements, radar rainfall forecasts, numerical weather prediction models, and hydrological models for short-range hydrological forecasting, (ii) combination of meteorological ensemble predictions with hydrological models for provision of probabilistic hydrological forecasts, and (iii) assimilation of in-situ and remote sensing measurements of hydrological variables for real-time updating of hydrological models.

The developed framework and tools will be tested and demonstrated for three problem areas, considering short- and medium-range flood forecasting, seasonal forecasting of irrigation potential, and environmental monitoring.

Contact person: Michael R. Rasmussen