[1] Probabilistic online runoff forecasting for urban catchments using inputs from rain gauges as well as statically and dynamically adjusted weather radar

* Homogeneous distribution of rainfall cannot be assumed due to some areas having more rain than others. If a homogenous distribution of rainfall is assumed an uneven use of the available storage capacities results.
* Can be improved with dynamic control, reducing risk of CSO
* Rainfall radars up to 2 hours (as we use)
* There are some references on radar vs rain gauge
* Radar measurements usually validated against rain gauge observations
* Studies have been made on what degree of spatial model resolution is appropriate
* Some stuff
* For investigation the influence of spatstial resolution of rainfall inputs on the ability to create stochastic runoff forecast, tree layouts are considered.
  + Area mean: rainfall averaged over whole catchment
  + Intergrated subbcatchment: Subcatchments but only one storage cascade used?
  + Distributed subcatchments: Every subcatchment has a cascade of 2 storages of its own
* Heuristic optimization algorithm used for automated parameter estimation
* Some good figures

[2] Probabilistic runoff volume forecasting in risk-based optimization for RTC of urban drainage systems

* Most RTC implementation aim to minimize the volume of CSO by dynamically controlling glows in the system to achieve an optimal explitation of the available storage volume, especially in cases with an uneven spatial rainfall distribution over the catchment.
* Information on the future evolution of the urban drainage system should contribute to more efficient optimization of the controlled system,
* A lot of uncertainties: input uncertainty, model structure uncertainty, parameter uncertainty and measurement uncertainty.
* Some studies say that forecasting diminishes for lead times greater thatn 90 min.
* Tree based control algorithm and DORA (dynamic overflow risk assesment).
* Some stuff
* Selction of rain events:::
* Don’t understand the whole with/without uncertainty,
* … Could read further.

[3] Evaluation of Maximum a Posteriori Estimation as

Data Assimilation Method for Forecasting

Infiltration-Inflow Affected Urban Runoff with

Radar Rainfall Input

* According to Roland: Pedersen has some nice illustrations of the overall problem and uses conceptual models
* Equation on dry weather flow
* Because models need to be computationally efficient, some loss of information are often the case due to simplification in model structure
* The rainfall forecast is seldom perfect
* Updating conceptual rainfall-runoff models using maximum aposteriori estimation to determine the most likely parameter constellation at the current point in time
* Some interesting stuff, not read thourougly

[4] Flow Forecasting using Deterministic Updating of Water Levels

in Distributed Hydrodynamic Urban Drainage Models

* Accodring to Roland: Hansen tries to apply hydrodynamic models for the same purpose as [3]
* Explains MOUSE hydrodynamic model
* There exist commercial physically based, distributed, hydrodynamic urban drainage models such as MIKE URBAN and more but they are neither simple nor fast.
* Uses hydrodynamics of pipe flows to solve diffEQ that can be computationally demanding.
* The reporst focuses on deterministic updating method for increasing flow forecasting performance
* MIKE URBAN divided up to two
  + Surface module
    - Conv precipitation data into inflow to the pipe system
  + Hydrodynamic model
    - Calculates the flow in the pipe system
* …
* ..

[5] Short-term prediction of influent flow in wastewater treatment

Plant

* Accodring to Roland: Wek uses ANN for [3]

[6] Short-term forecasting of urban storm water runoff

in real-time using extrapolated radar rainfall data

* Accodring to Roland: Thorndahl focus on the quality of radar forecasts but may be a good reference for the forecast skills that can be expected.
* ..
* Uses NSE to measure how well the modeled data fits the observed data

Tips

* Are available (in stead of are gottne)
* Mention that we can see diurnal dry weather variations
* Are there any gaps in training period
* What rainfall measurmetns do we condider dry weather (in 1. 0.2mm/10min is condidered dry and only consider events with a total rainfall sum of at least 5mm)
* Fig 5 in [1] shows rain event total rainfall and max rainfall intensity for comparison, this could be good to include. Also fig 6.
* Correlation: something similar to [1]. Fig 7.
* Figure 8 in [1] shows comparison in prediction between catchments.
* Including all identified rain events in Appendix as [2]
* How many were considered in training.
* “Data is sampled with temporal resolution of 10 minutes…”
* “Spatial resolution..what is?”
* “Furthermore, since the
* runoff model is auto-calibrated against flow-measurements in real-time, the radar data calibration becomes an integrated part of the overall calibration of the drainage model, eliminating the need for an individual a priori calibration of the rainfall input.”
* Talk about optimization technique
* Runoff can be influenced due to snow and snowmelt runoff.

[7] Development of a semi-automated model identification

and calibration tool for conceptual modelling of sewer

systems

* According to Roland: Wolfs doesn’t do forecasting (only simulation), but considers yet another model type that in principle also could be useful for forecasting.

[8] Conditional parametric models for storm sewer runoff

* According to Roland: Jonsdottir uses conditional parametric models for forecasting.