

Quality & Flow

- Storm Water is Flow
- Predictable towards the mean
- Unlikely events will happen, with immediate consequences
- Infrastructure built to cope
- Storm Water is Quality
- Huge number of various pollutants
- No purification in general
- Continuous degradation of recipients over time

Infrastructure legacy

- Old paradigm for existing infrastructure, “divert to nearest recipient without purification”
- Urban spread make infrastructure modification difficult & expensive
- Attack pollution at the source or at the recipient?
- Life cycle cost?
- What level of pollution is acceptable?

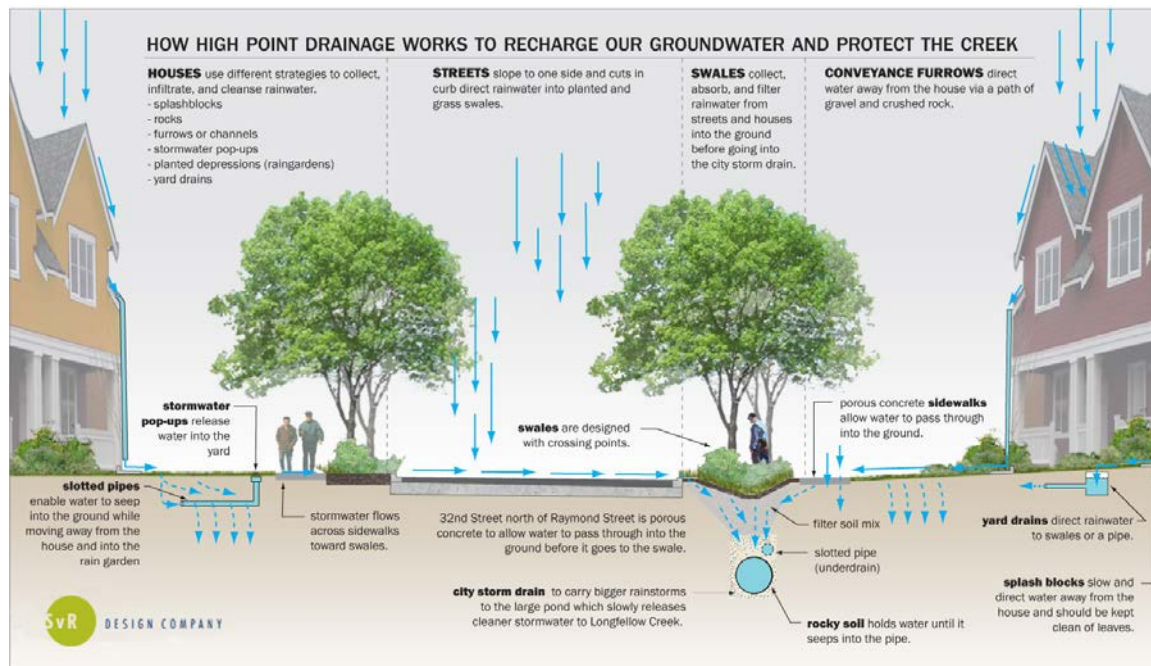
Pollutants



- Storm Water is Quality, a reflection of local human activities
- Heavy Metals, PAH, Pesticides, oils
- Composition and concentration varies over area, time of day-week-year as well as of flow

Purify by Design

- Many successful projects shape urban planning for the future
- But that is just the small tip of the iceberg

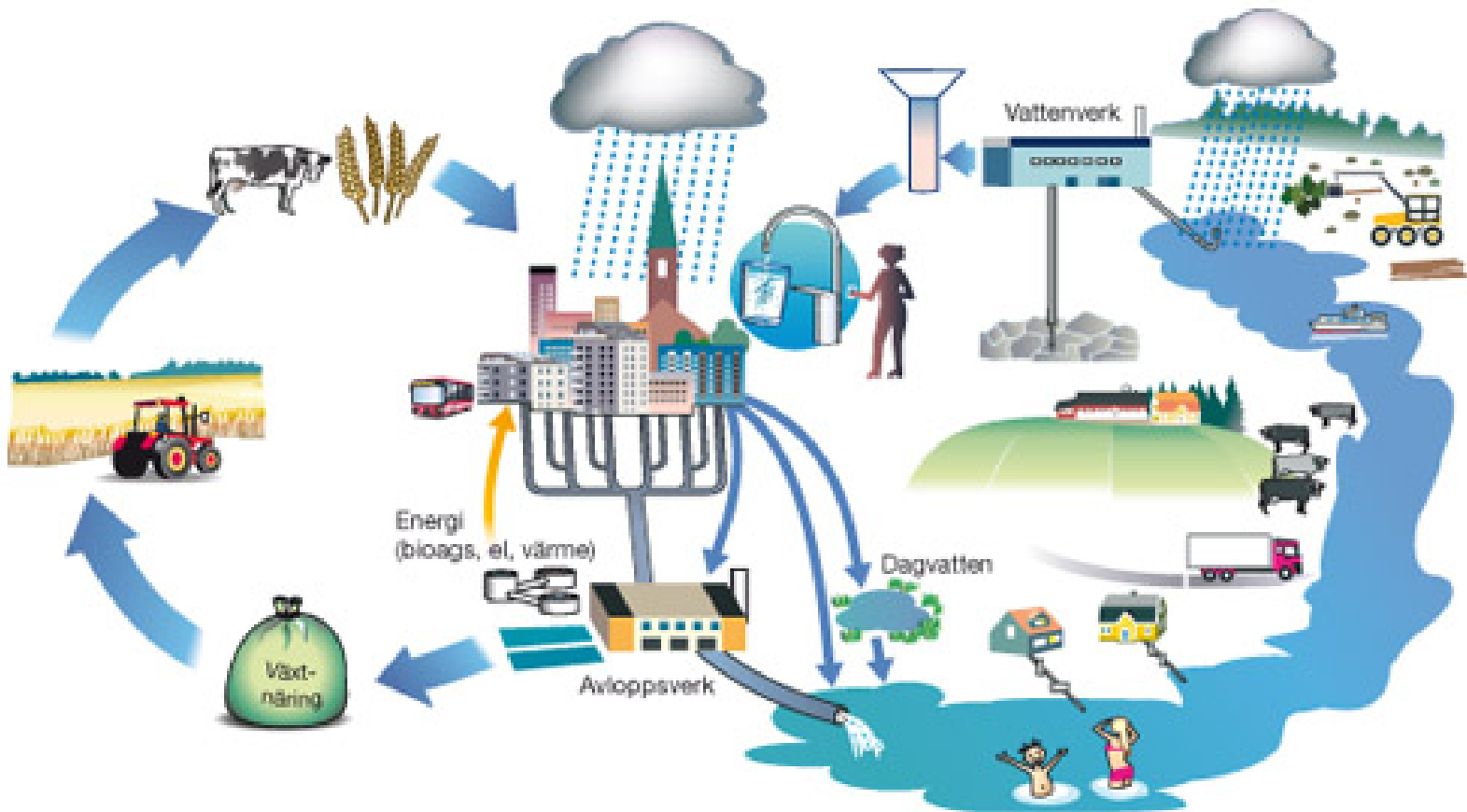


Attitudes & Legislation

- EU, National & Local
- Enforcement is key
- Allocating responsibility
- Storm Water is Quality, a reflection of local human activities.
- Environmental concern is a generational issue
- Cost effectiveness is legitimacy

Purification technologies

- Wide array of solutions for even wider set of challenges.

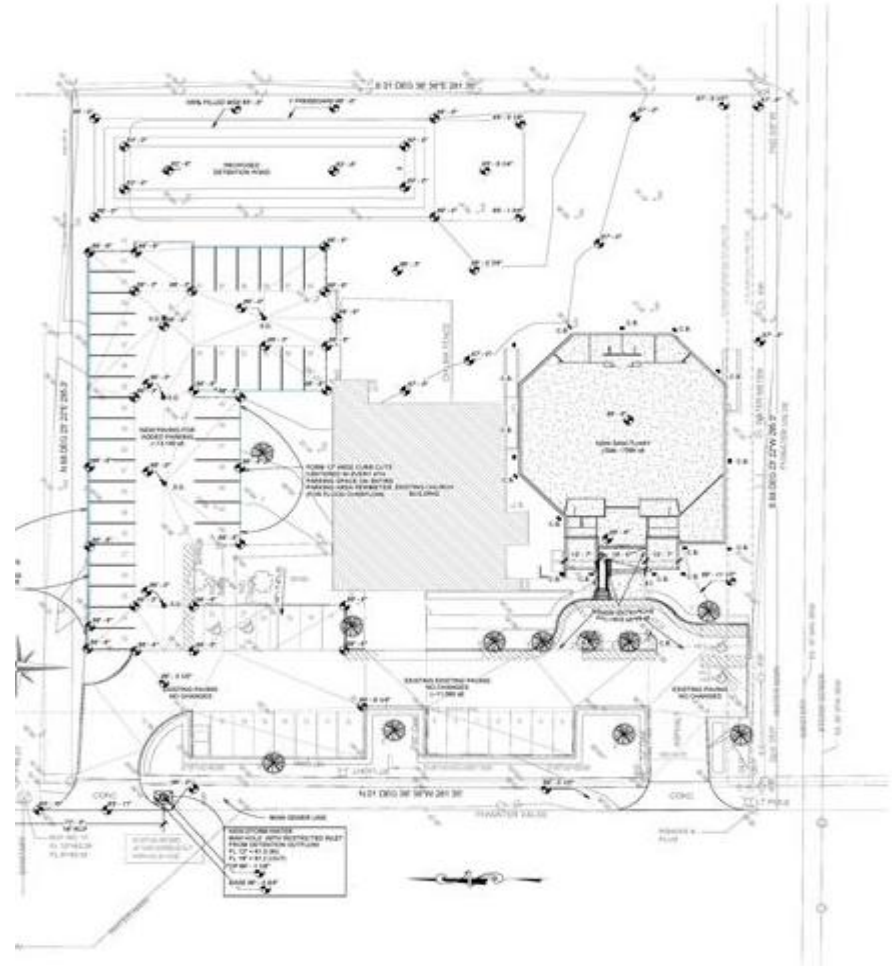


Monitor where & what?

- Proliferation of cheap sensors will enable near real-time monitoring of critical areas.
- From catchment area to recipient
- **Outflow from properties with regard to permits**
- Different substances require different technologies, challenging to find sensors
- Need to be cheap, robust and low energy
- **Not necessarily linear, stable or exact. But predicatble**

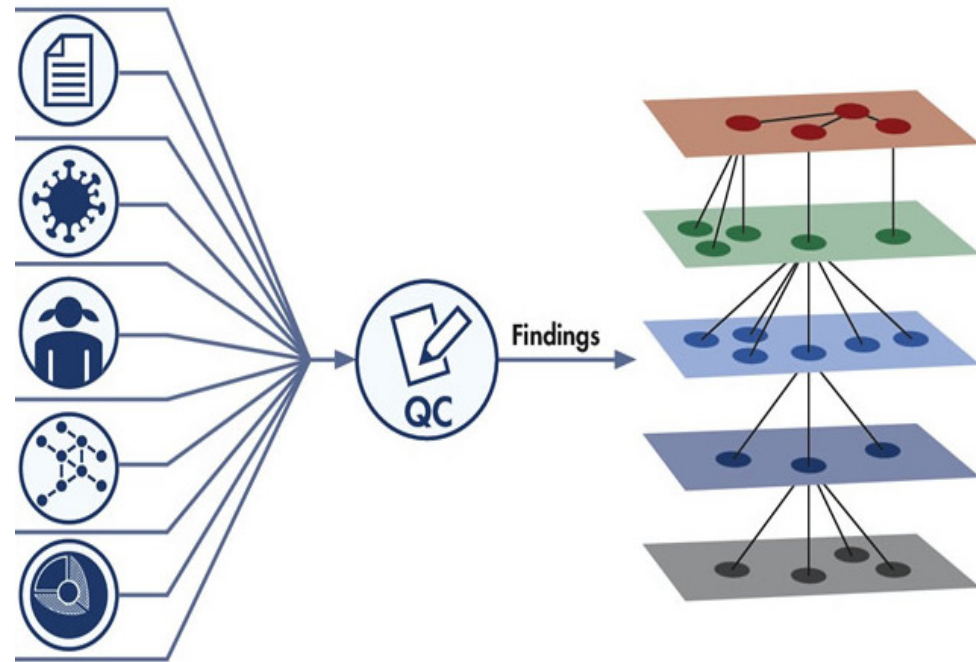
Monitor to control the issue

- Timely data will help allocate responsibility to correct party
- Sensor/activator loops will enable rapid actions
- Wide data sets will enable correct assessment of environmental load on specific areas



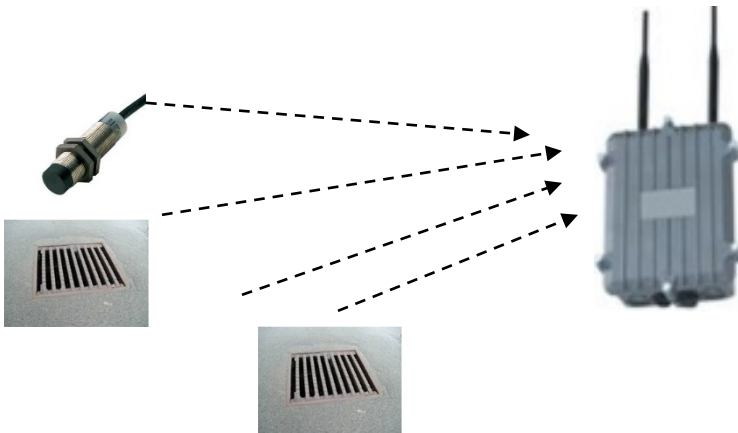
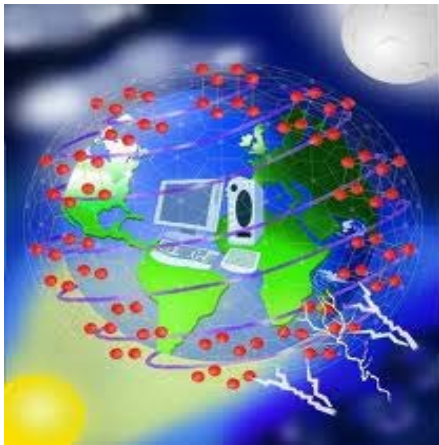
Monitor to Build Knowledgebase

- Abundance of data may help identify effects of multiple pollutants in complex environments
- Open Data initiatives can help drive initiatives and change
- Factual inputs to urban planning and cost/benefit analysis



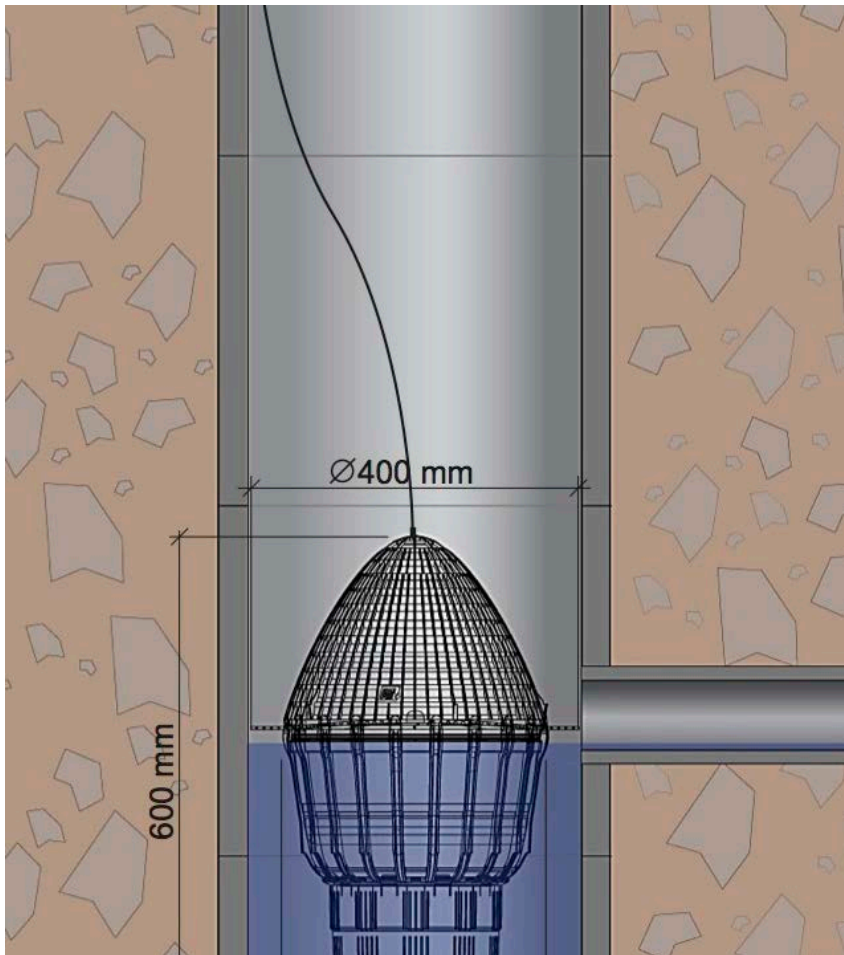
Sense & Display

- IoT



- Data storage is virtually free.
- Data communication and networking has a global infrastructure in place
- Big Data tools are abundant
- Sensors is the big challenge
- Hyper development going on now, thanks to IoT

Decide & Deploy



- Limited resources will be deployed to the greatest effect
- Technology choice will be aided by facts on (under) the ground
- **Emergency services will act ex ante.**

SWE
DROP

SWE
CIN



BEYOND CLEAN WATER

The immediate solution – the obvious choice