Beware of the standards

we need the best meteo data for innovative solutions

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Stichting RIONED

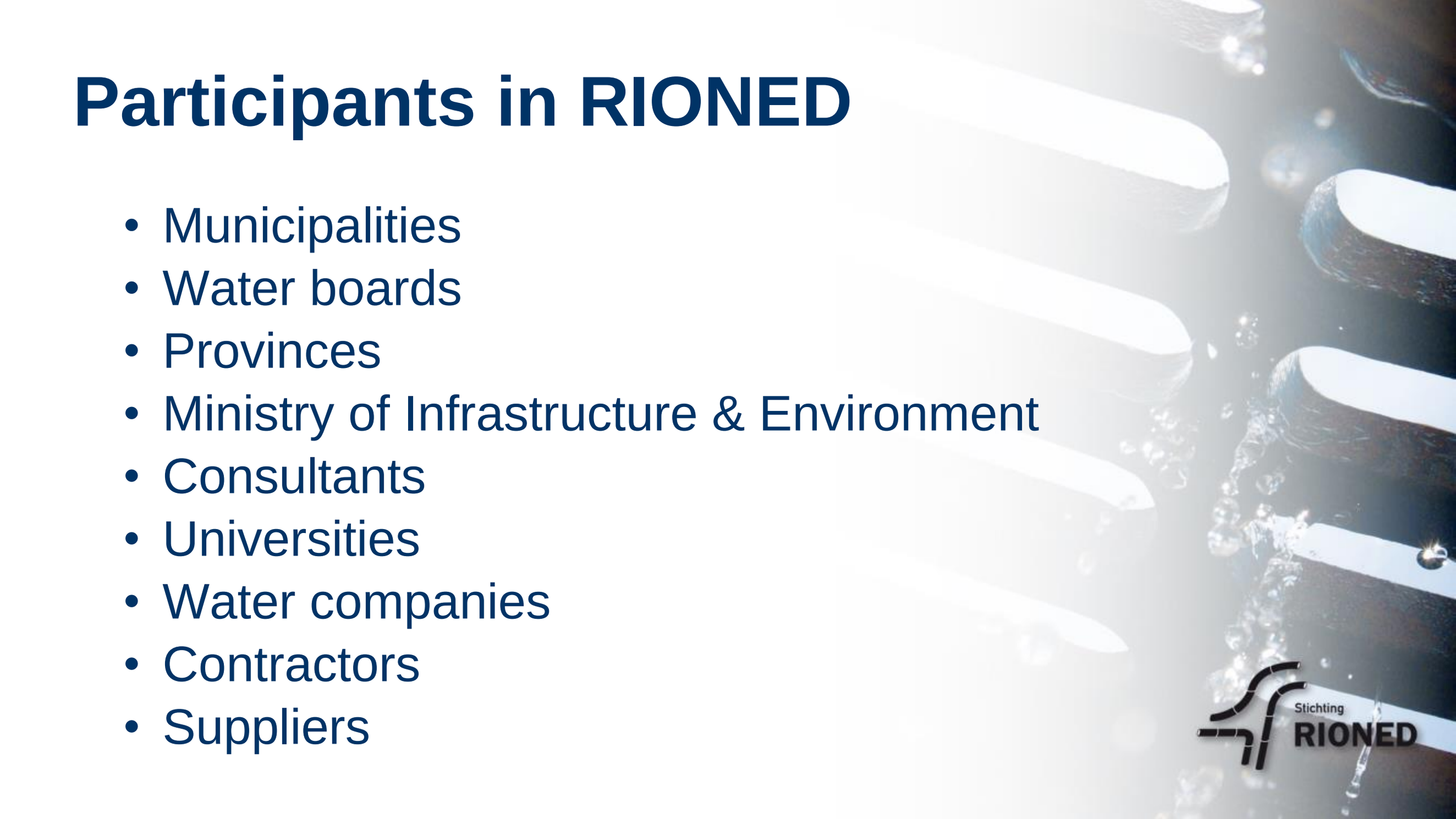
3 november 2015

Urban Drainage knowledge center

- Private, non profit organisation
- National information centre
- Collective programming & financing
  - Research
  - Standardization
  - Training and communication
- Through and for the target group
- Annual turnover > 2 million Euros

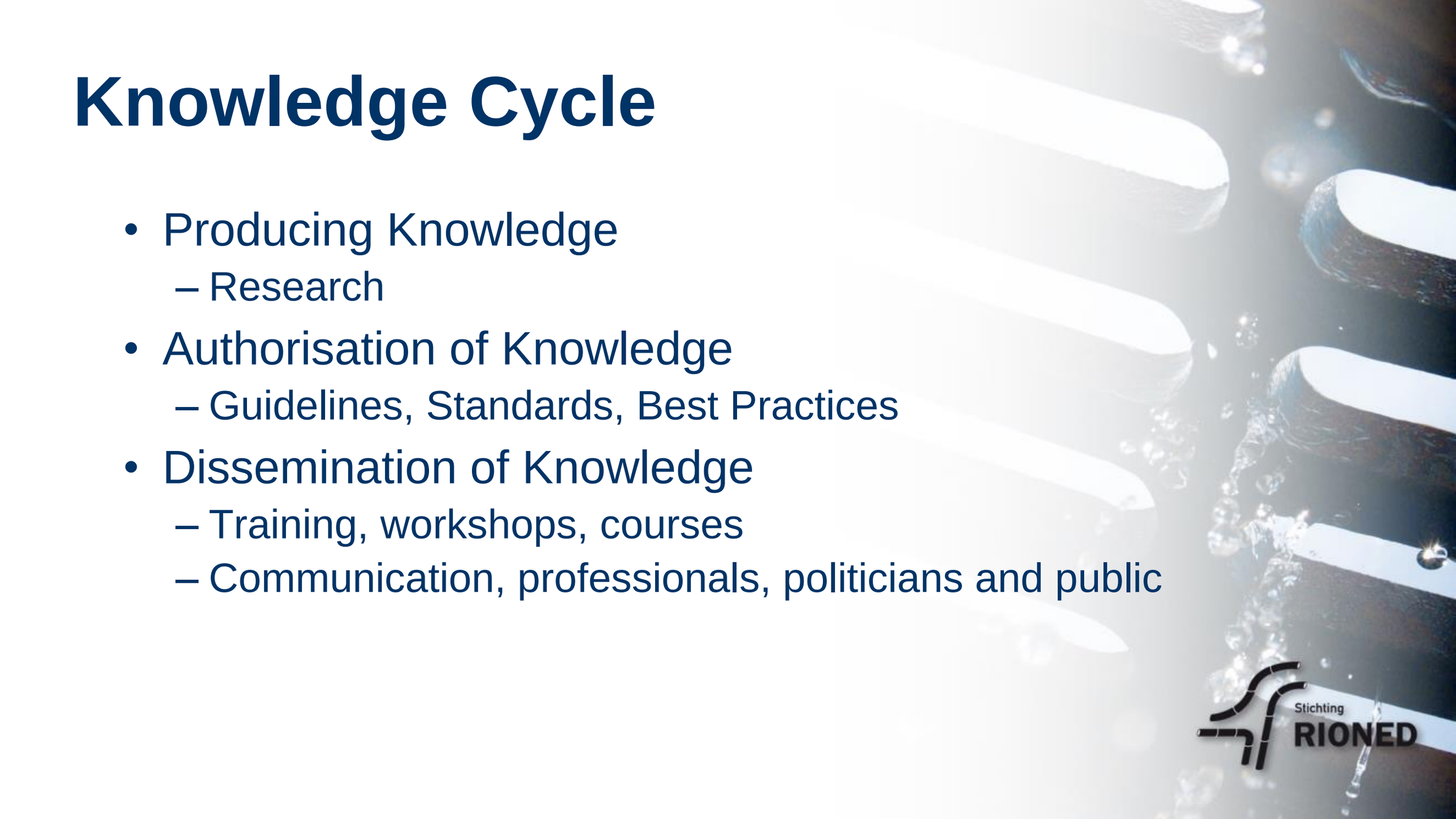
Participants in RIONED

- Municipalities
- Water boards
- Provinces
- Ministry of Infrastructure & Environment
- Consultants
- Universities
- Water companies
- Contractors
- Suppliers



Knowledge Cycle

- Producing Knowledge
  - Research
- Authorisation of Knowledge
  - Guidelines, Standards, Best Practices
- Dissemination of Knowledge
  - Training, workshops, courses
  - Communication, professionals, politicians and public



Beware of the standards

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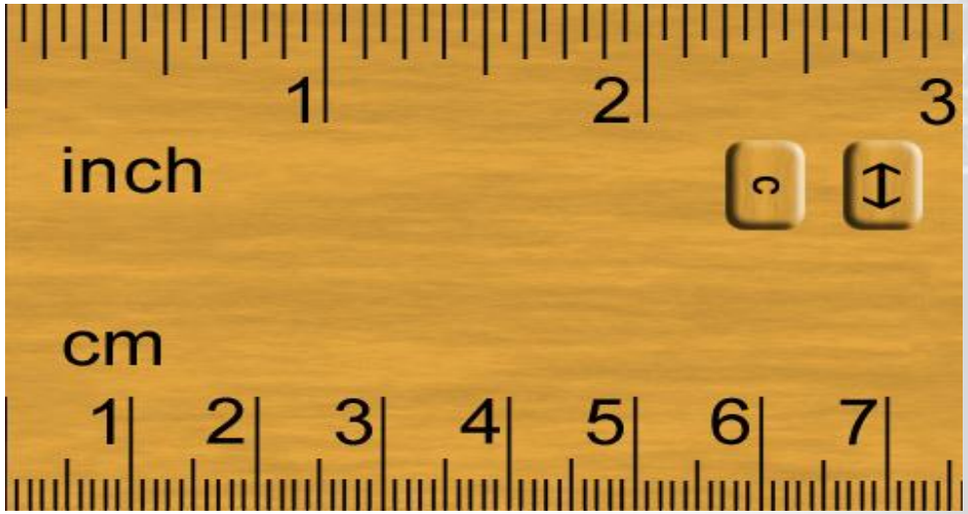
Standards can be very useful



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Essential in standards

- Suitable measuring methods must be available to apply standards
- Clear examples for a good utilization of the measuring method are necessary
- Wrong utilization of a standard can mean that the cure could be worse than the disease
- Old school measuring methods can slow down or block innovative developments/solutions

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Urban drainage

- Innovative technical environment
- Big differences between municipalities
- Gradually filling the gaps in essential information
- Limited level of expertise and experience on a new subject because extreme events are rare
- Big uncertainties in climate change
- We need flexibility in guidelines

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Focus on extreme rainfall

- More important than climate change.
- Future predictions on extreme rainfall are extremely uncertain.
- Time resolution of climate scenarios is too long. Most KNMI information is based daily rainfall
- Hourly rainfall is related to clock-hours, look at the article on the record rainfall event in Herwijnen 79 mm in a clock hour, in reality 94 mm in 70 minutes.
- Statistics are useful, but results from the past are no guarantee for the future

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Examples of standards and regulations

- Success and failure

Examples of regulations

- Roof drainage - effective overload protection roof
- Tunnel drainage - wrong measuring method/system
- Building drainage - massive complex regulations
- Private sewer systems - measuring method too simple
- Public sewer systems - major developments
- Comb. sewer overflows - misuse of good standards
- European water framework directive - hype is over?

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Urban Drainage until 1970

- Focus on sewer system
- Static approach
- Constant rainfall intensity
- Manual calculator
- Expert judgement

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Urban Drainage 1970 - 1990

- Focus on sewer system
- Static approach
- Constant rainfall intensity
- Return period 2 years
- Early use of computer
- Input and output in tables

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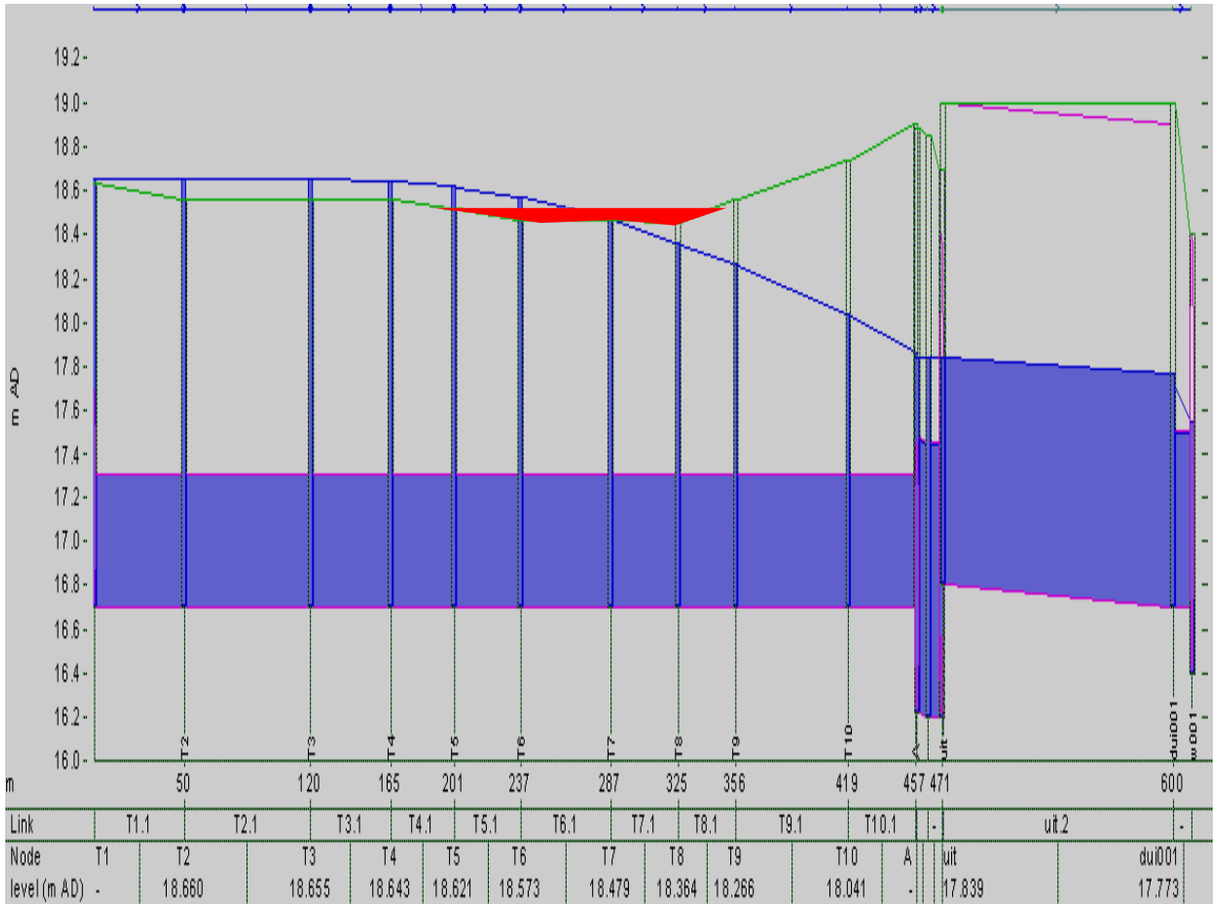
Urban Drainage 1990 - 2010



- Focus on sewer system
- Dynamic approach
- Guideline RIONED C2200
- Standard rainfall event 08 and 15 min rain series
- Return period 2 years
- Intensive use of computer
- Output on screen

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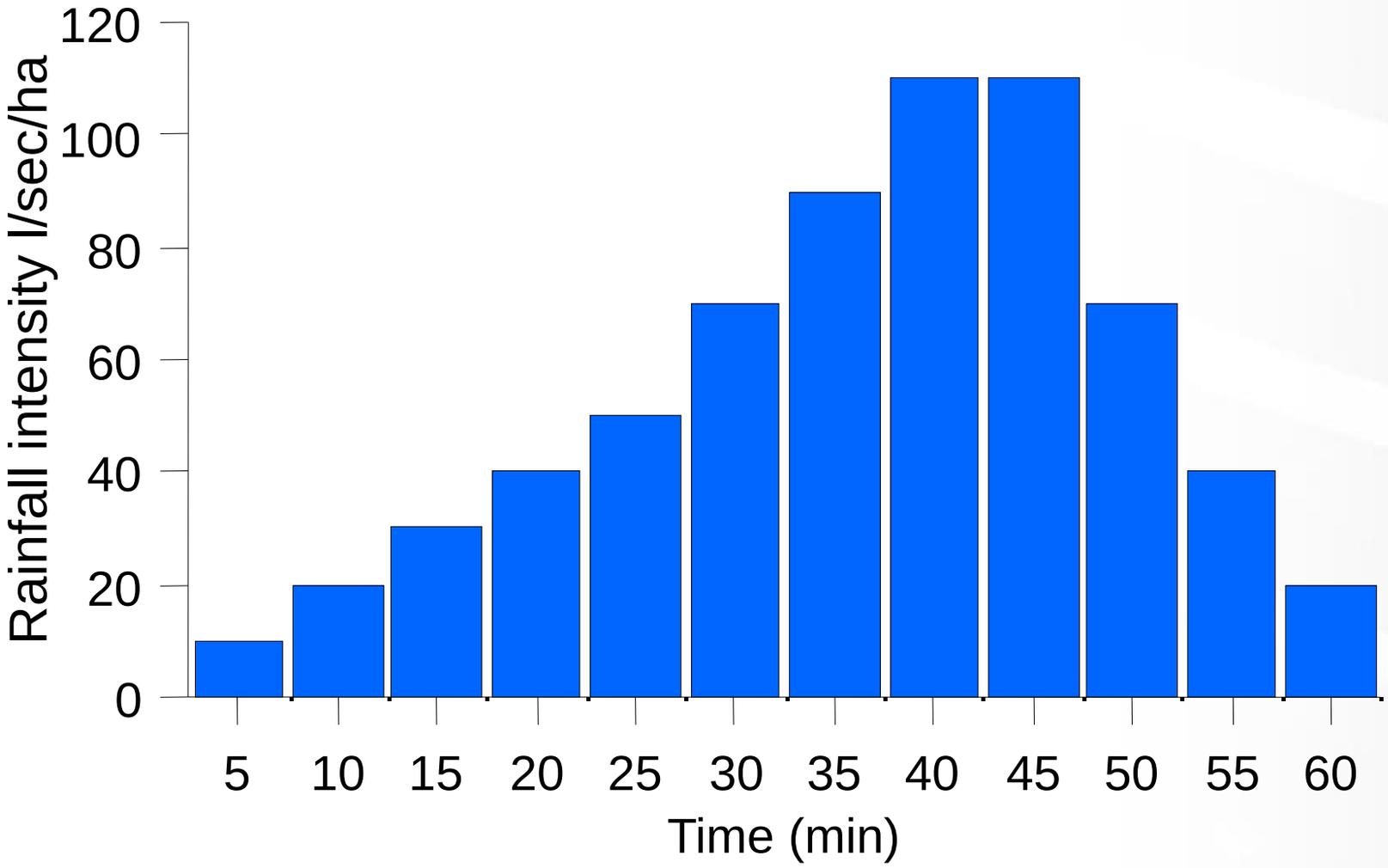
Rainfall event 08, return period 2 years



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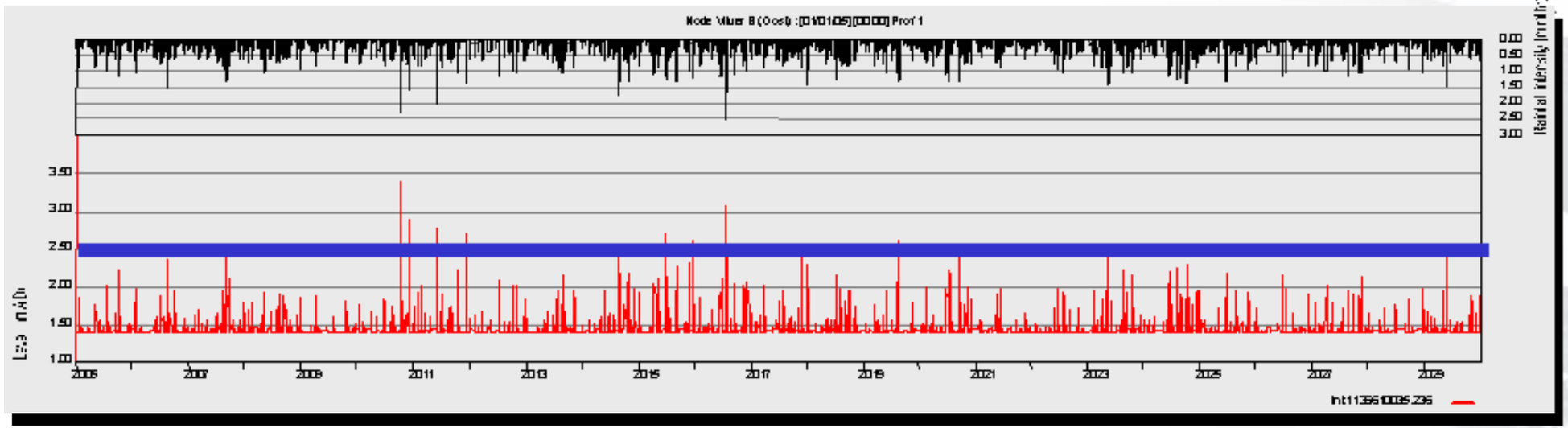
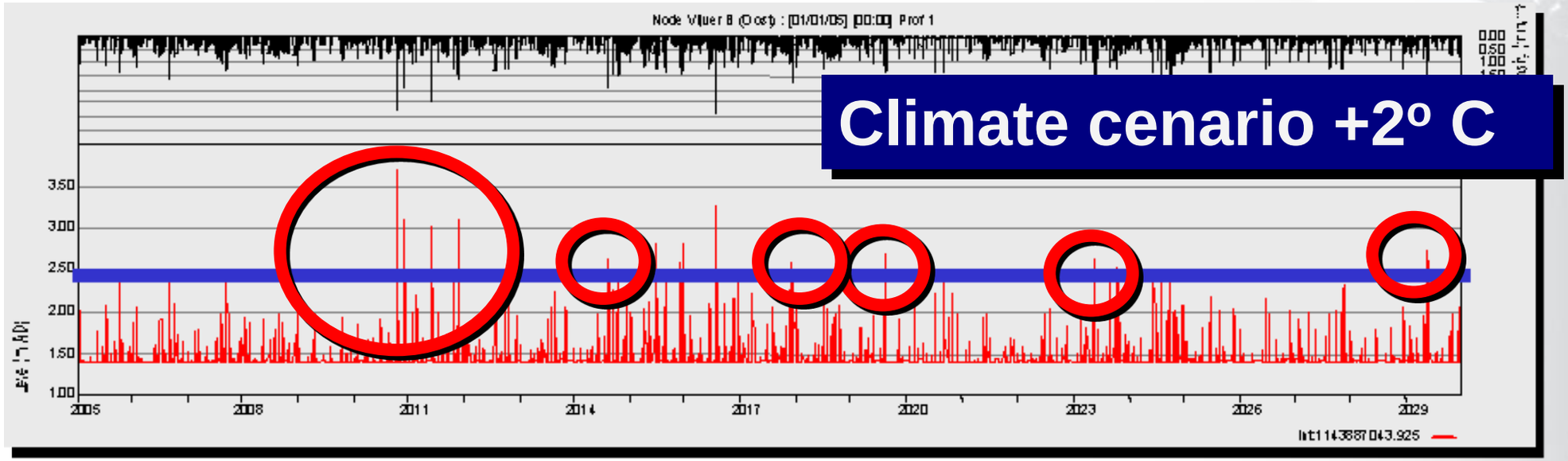
Rain series simulation waterlevel pond





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Urban Drainage 2010 - future

- Focus on urban environment, minor and major systems
- 3D dynamic approach
- Development of impact test
- Extreme spatial rainfall events
- Return period of 25-1000 years
- Intensive use of computers
- Output in virtual reality

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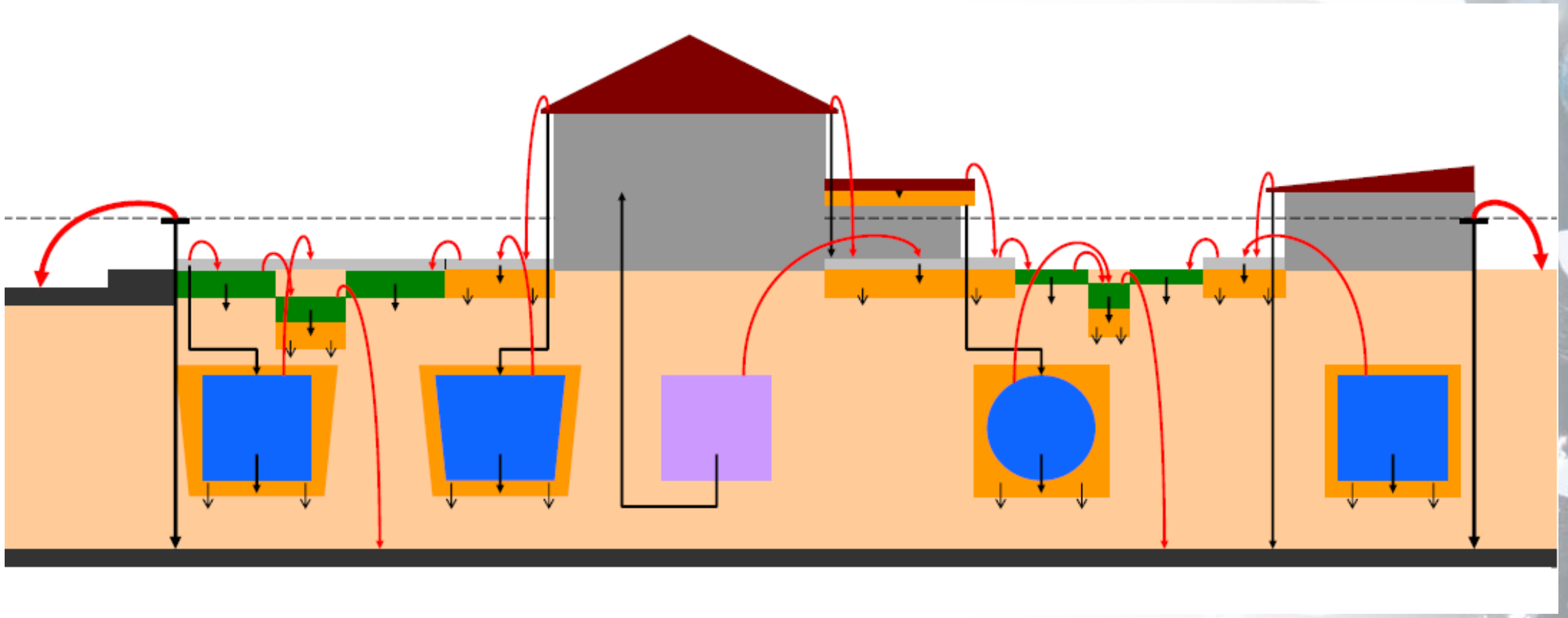
Extreme events / rainfall series



Small scale design (check)

RainTools

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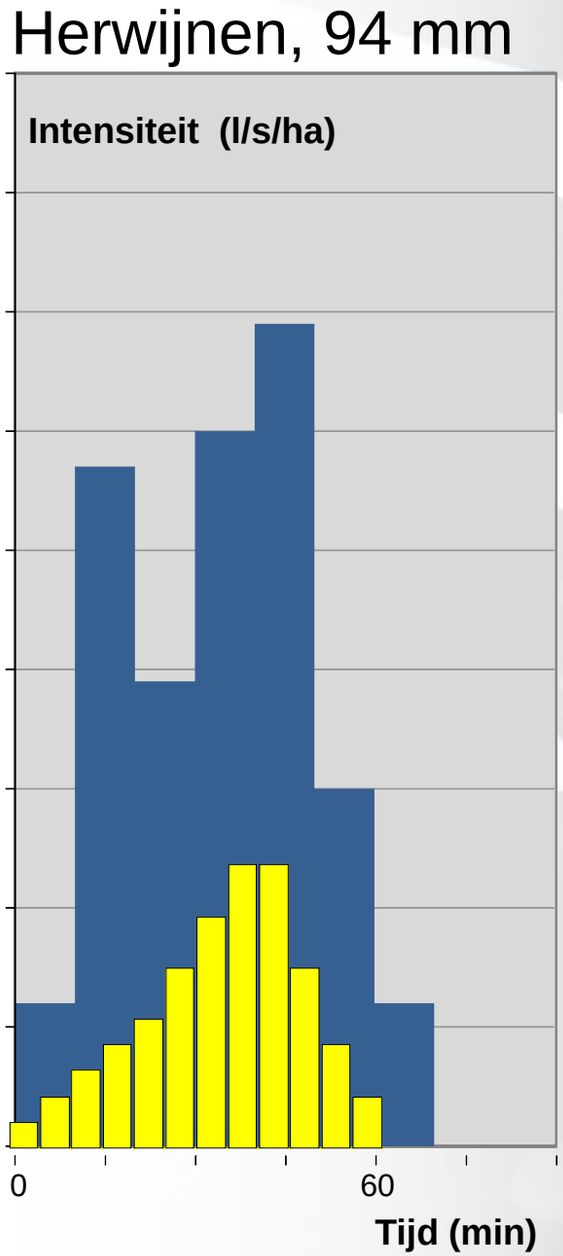
Meteorological information needed !

- Urban drainage in built up areas
- Available meteorological information at the level of urban drainage design before 1990 !

Extreme events

- Often very local effect, need for spatial rainfall information
- Difficult to catch an extreme event in a rain gauge
- Very difficult to catch an extreme event in a official KNMI rain gauge



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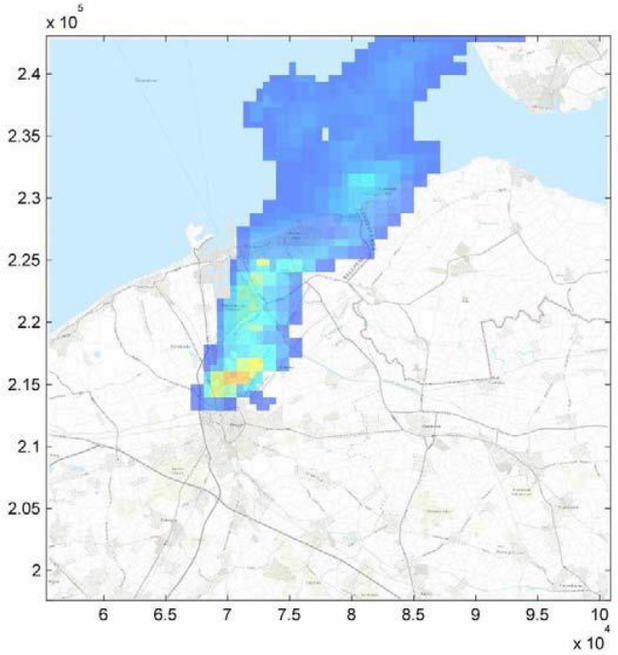
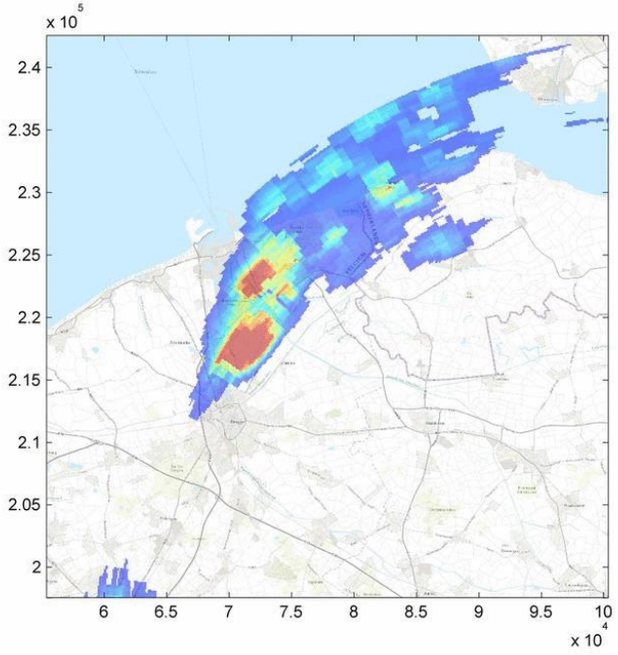
Radar development

- C-band radar image:
  - Time resolution 5 min
  - Spatial resolution 1 km



- X-band radar image:
  - Time resolution 1 min
  - Spatial resolution 50 m
  - Short range



Bron: prof. dr. ir. Patrick Willems, KU Leuven

Information of extreme rainfall events

- Spatial distribution of rainfall is very important
- Information of an amount of rainfall in a rain gauge is too limited to determine the specific rain load on an urban area
- Present radar images tend to underestimate the extreme rainfall intensities substantially
- More advanced correction methods of rainfall images with rain gauges need to be developed

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Awareness of extreme rainfall events

- Urban drainage managers need more accurate information of an extreme rainfall event.
- An atlas of well documented historic (radar) rainfall events can help us to assess and to explain the effects on the urban environment:
  - Was there a lot of damage due to flooding during a less extreme event or was there nearly no damage during a very extreme event.

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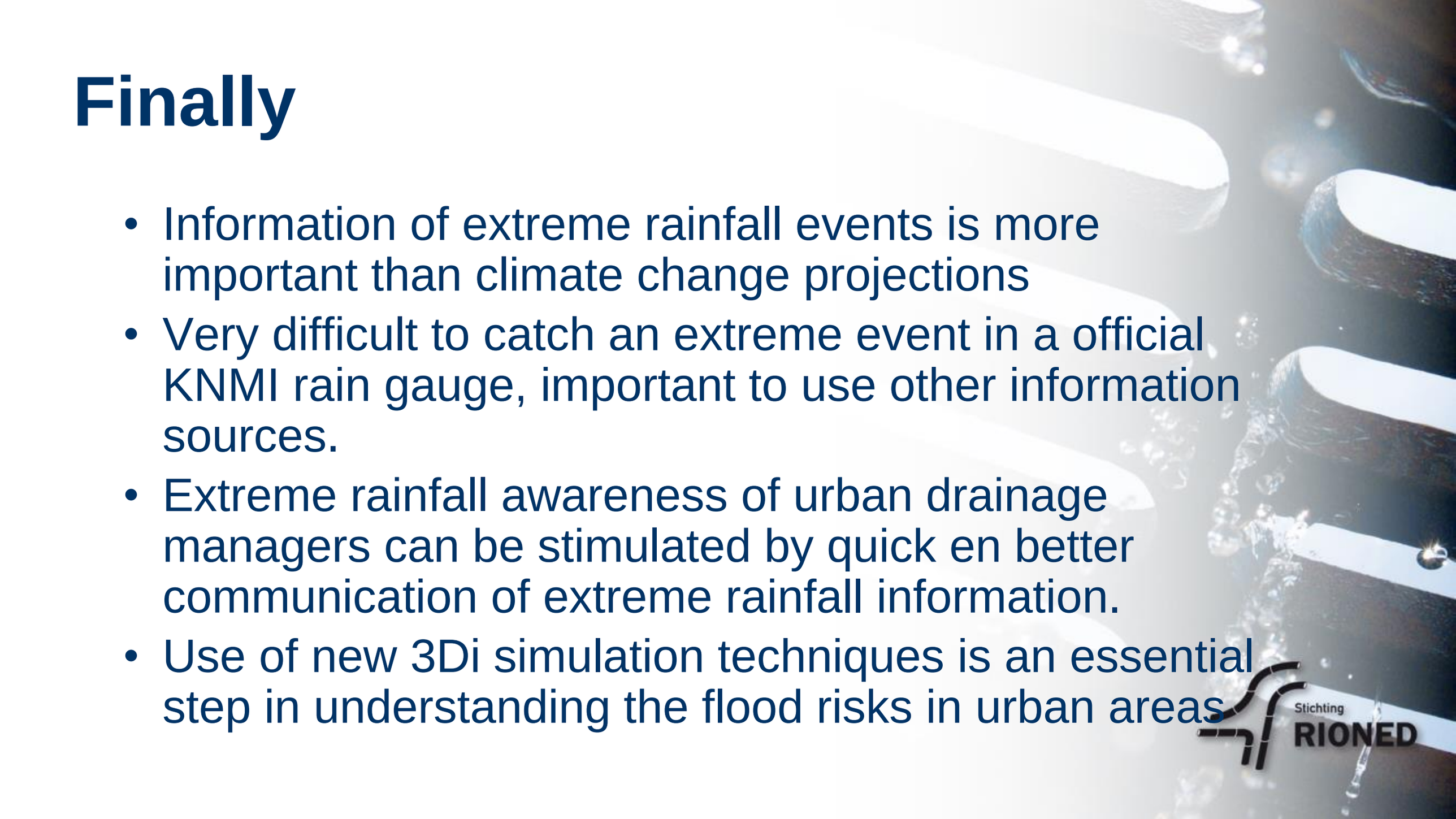
Conclusions

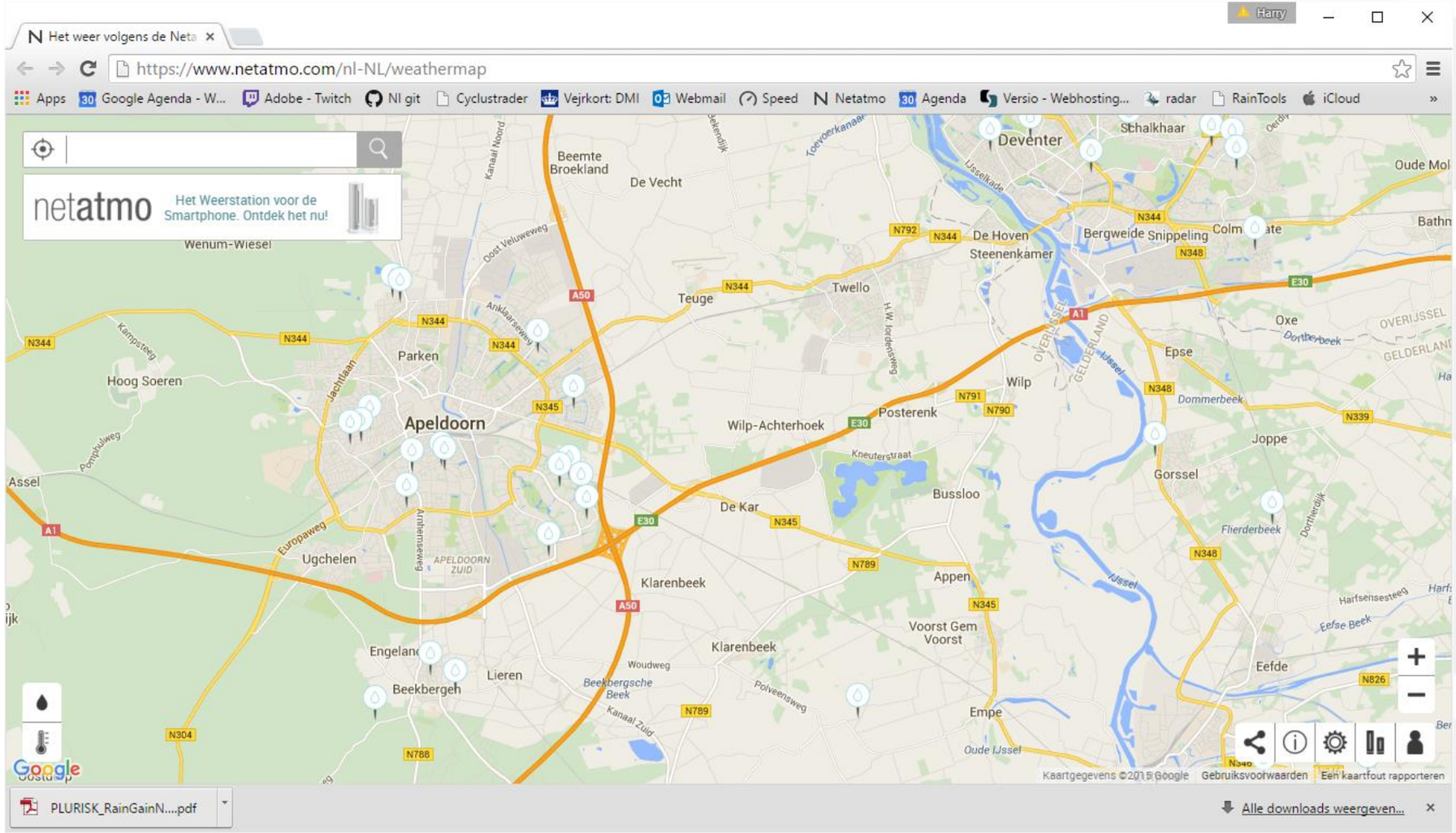
- Old school measuring methods can slow down or block innovative developments/solutions

Finally

- Information of extreme rainfall events is more important than climate change projections
- Very difficult to catch an extreme event in a official KNMI rain gauge, important to use other information sources.
- Extreme rainfall awareness of urban drainage managers can be stimulated by quick en better communication of extreme rainfall information.
- Use of new 3Di simulation techniques is an essential step in understanding the flood risks in urban areas



Rainfall data revolution?



A fast growing number of private rain gauges

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Spatial information of extreme rainfall

- We do not need the most accurate statistics
- We do not need the most accurate climate projections
- We need the best spatial information of severe and extreme rainfall events to feed our new 3D urban flooding models.
- Understanding the functioning of the urban area under the load of extreme rainfall events is the most important step we have to make.

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Handout: http://bit.ly/1Q2Ra00

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