RainGain

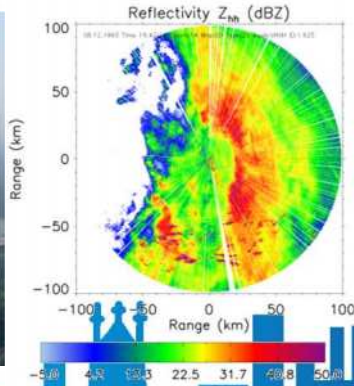
National Observer Group (NOG) Meeting, BE

Leuven, 18 april 2012

Introductie RainGain Project

Marie-Claire ten Veldhuis

Project coordinator



Extreme neerslag en wateroverlast in de stad

Rotterdam regio,
Juli 2011

Extreme neerslag en wateroverlast in de stad

What gebeurde er precies?

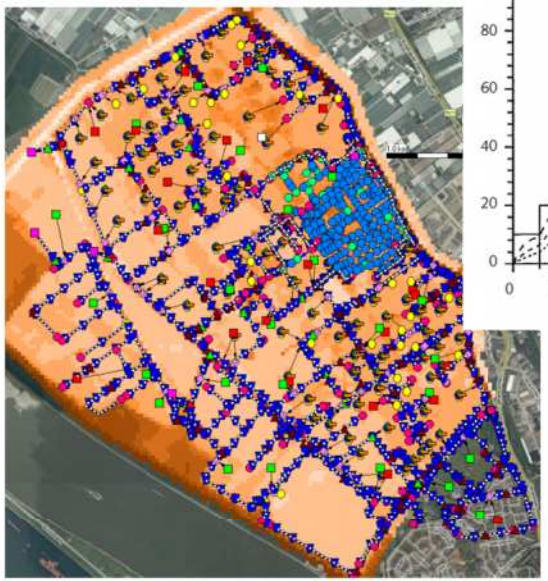
- Hoeveel neerslag (volume+intensiteit)?
- Capaciteitsprobleem?
- Storing/Verstopping?
- Ontwerp-/operationele fout?

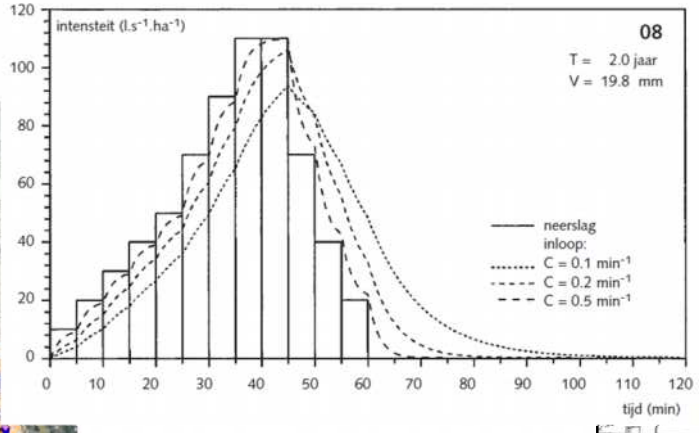
Rotterdam regio, Juli 2011

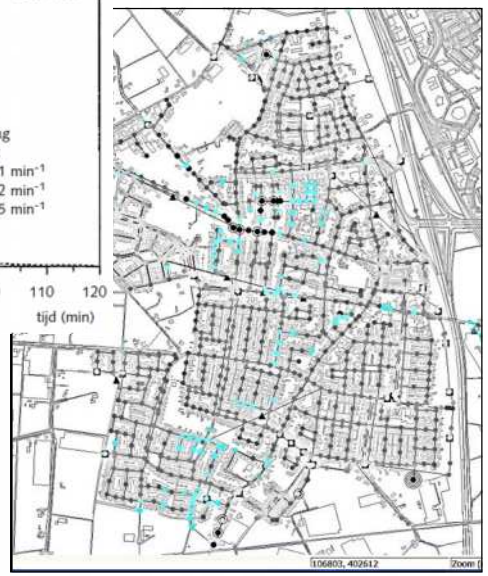
Extreme neerslag en wateroverlast in de stad

Extreme neerslag en wateroverlast in de stad

Benodigde data resolutie << 1 km in ruimte; < 5 min in tijd







Oranjepolder: 490 ha

Prinsenbeek: 100 ha

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hoge resolutie neerslag- en wateroverlastinformatie in steden

Xband/Verbeterde Cband radars in 4 Pilots:

- Rotterdam (NL)
- Leuven (B)
- Paris (F)
- London (UK)

RAINGAIN: 13 Partners

1) TU Delft (NL)
2) Zuid-Holland Province (NL)
3) Gemeentewerken Rotterdam (NL)
4) KU Leuven (B)
5) Aquafin NV (B)
6) Ecole des Ponts ParisTech (F)
7) Marne-la-Vallée (F)
8) Seine-St.-Denis (F)
9) Météo France (F)
10) Véolia (F)
11) Imperial College London (UK)
12) Met Office (UK)
13) Local Government Flood Forum (UK)

4 Pilots:

Rotterdam (NL)

Leuven (B)

Marne-la-Vallée (F)
Seine-St.-Denis (F)

Croydon (UK)
Redbridge (UK)

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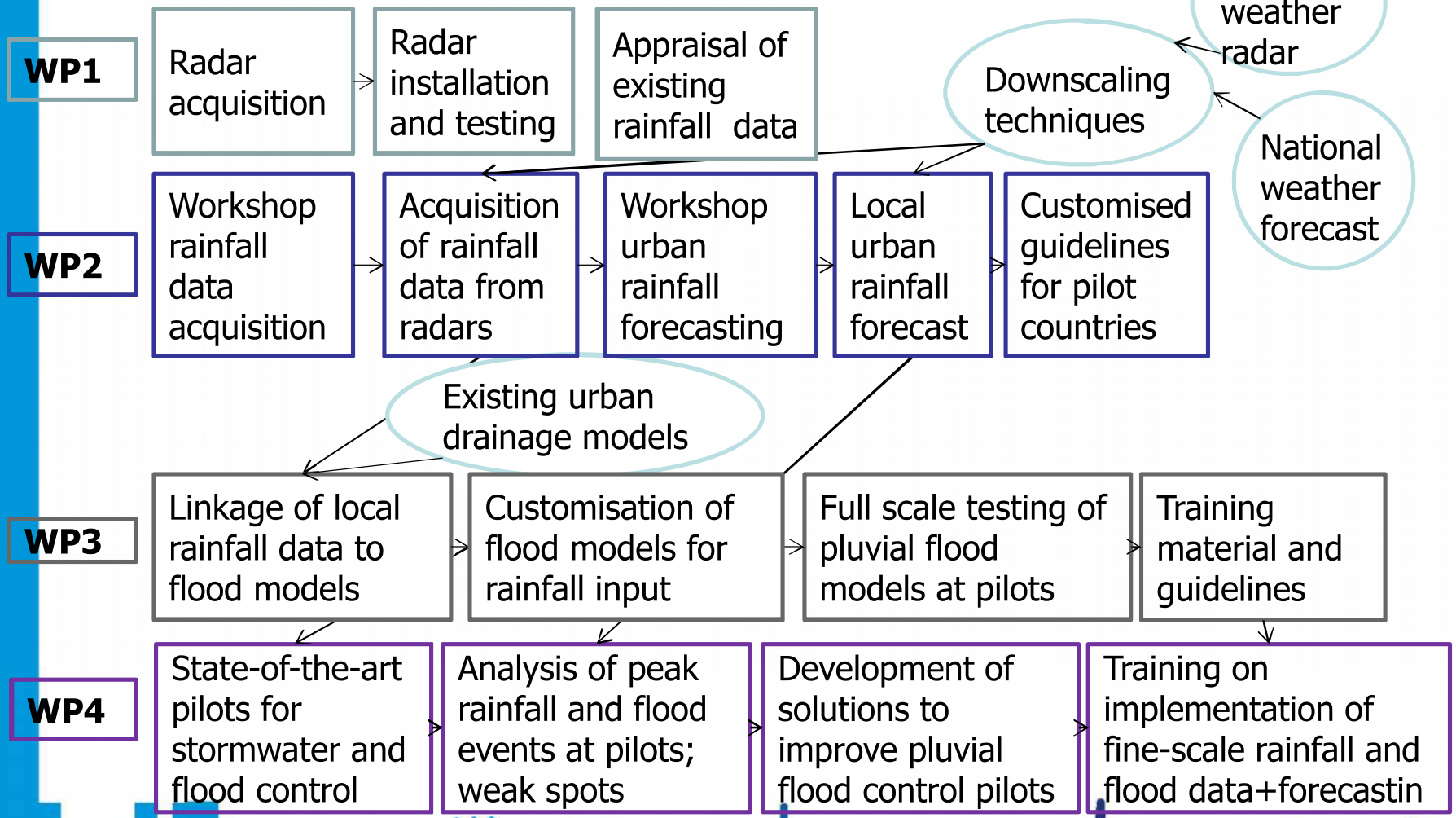
hoge resolutie neerslag- en wateroverlastinformatie in steden

- WP1: Installatie en testen van radars
  Trekker: ParisTech
- WP2: Fijnschalige neerslagmeting en -voorspelling
  Trekker: KU Leuven
- WP3: Stedelijke wateroverlastmodellering en voorspelling
  Trekker: Imperial College of London
- WP4: Implementatie van fijnschalige neerslagmeting, wateroverlastmodellering en –voorspelling in praktijk stedelijk waterbeheer
  Trekker: TU Delft

RainGain- WPs and Actions

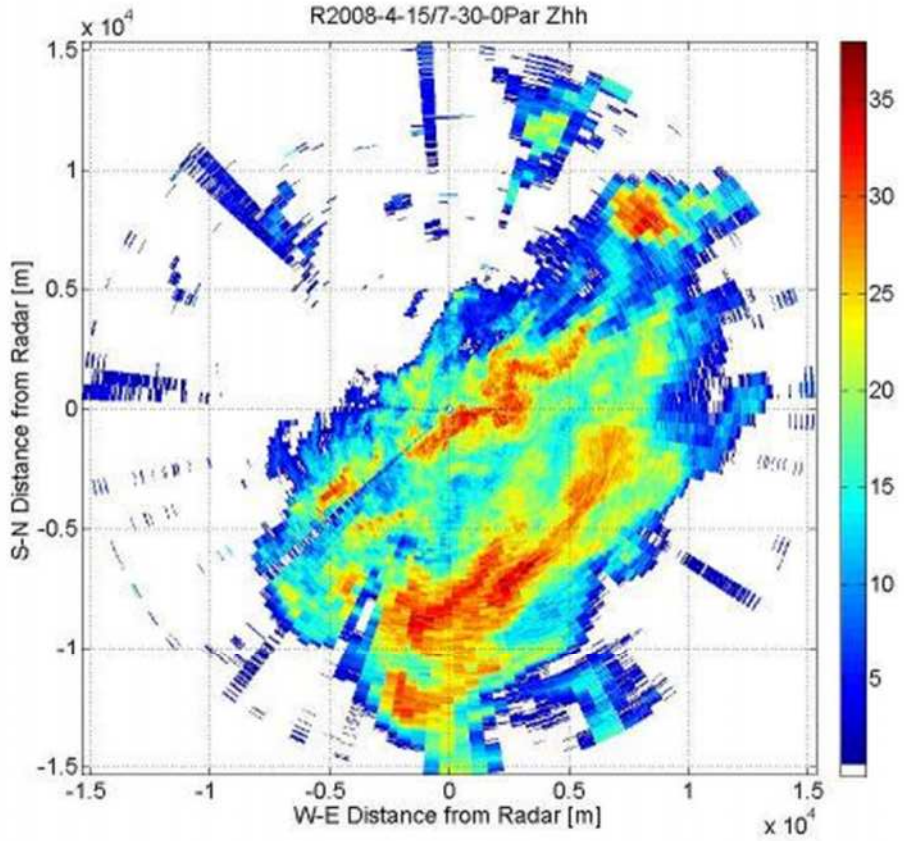


Data resolutie << 1 km in ruimte; < 5 min in tijd

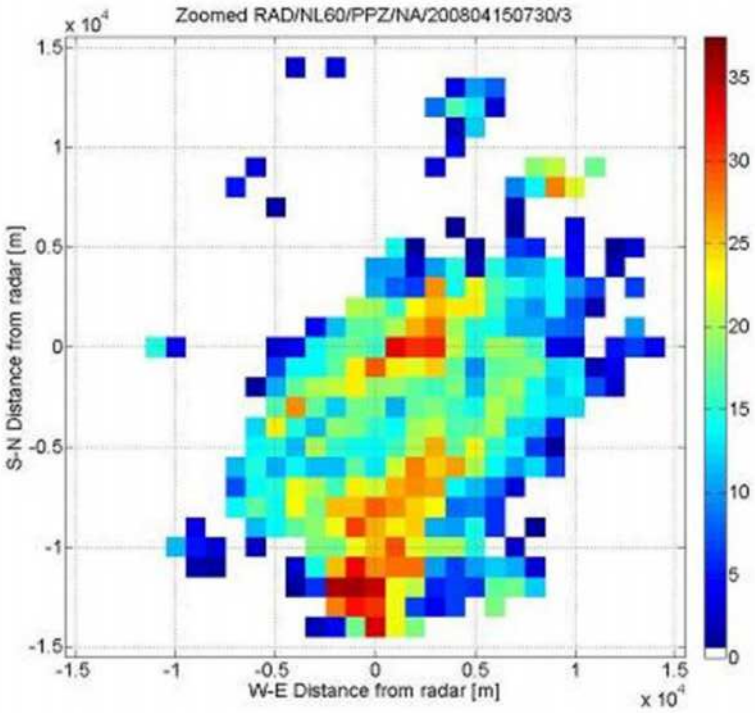
X-band radar:

hoge resolutie neerslagobservatie

DR= 30 m



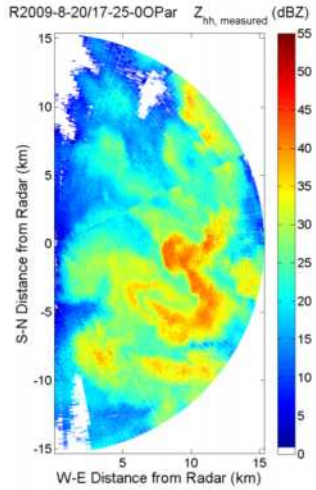
DR= 1 km



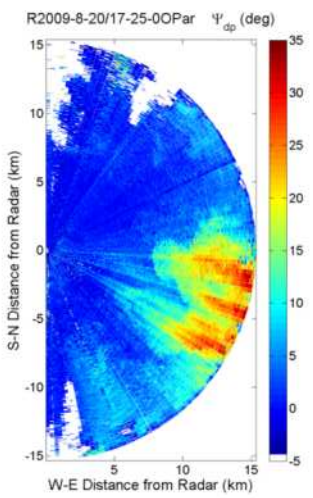
Courtesy: KNMI

Polarimetric X-band radar

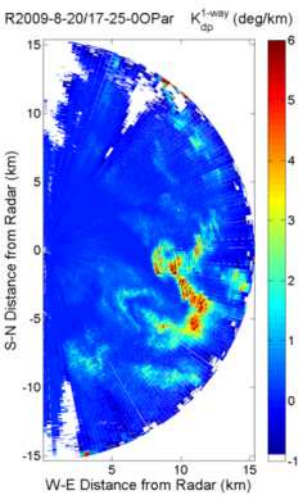
reflectivity (dBZ)



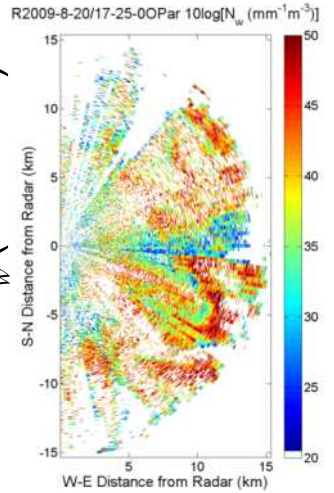
differential phase (°)



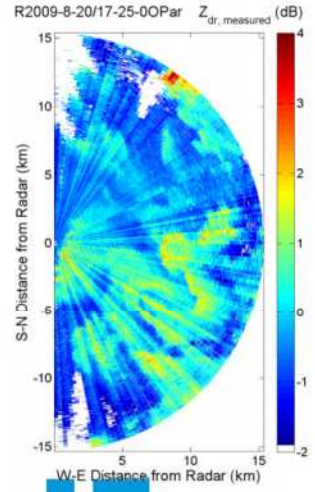
specific diff. phase (°/km)



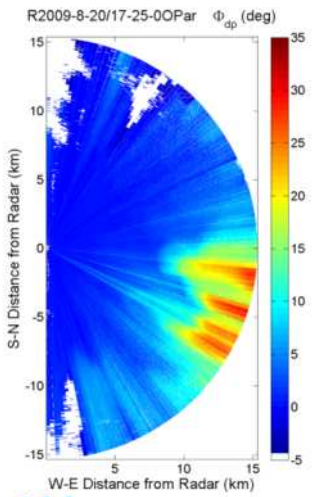
RDSD N_w (mm^{-1} m^{-3})



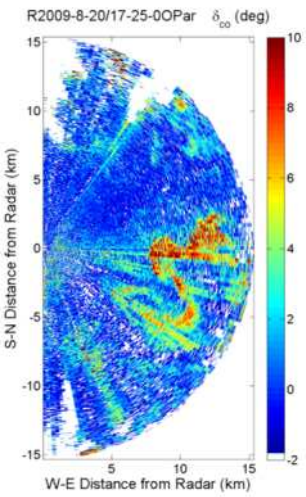
differential reflectivity (dB)



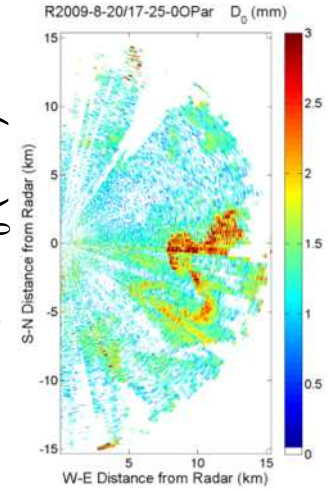
diff. propagation phase (°)



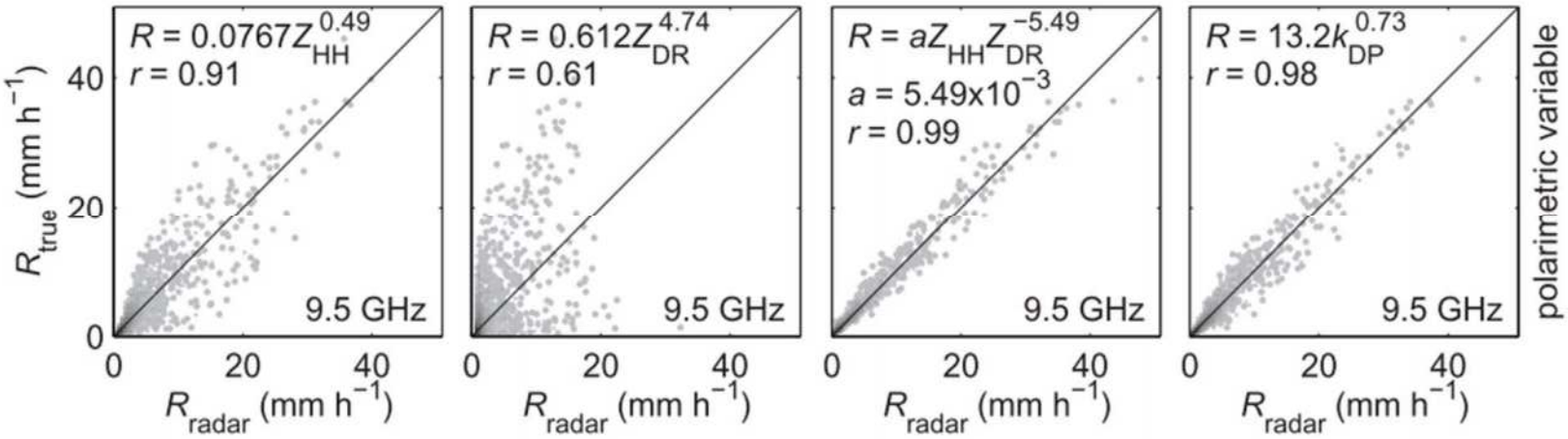
diff. backscatter phase (°)



RDSD D_0 (mm)



Invloed van polarimetrie op schatting neerslaghoeveelheid

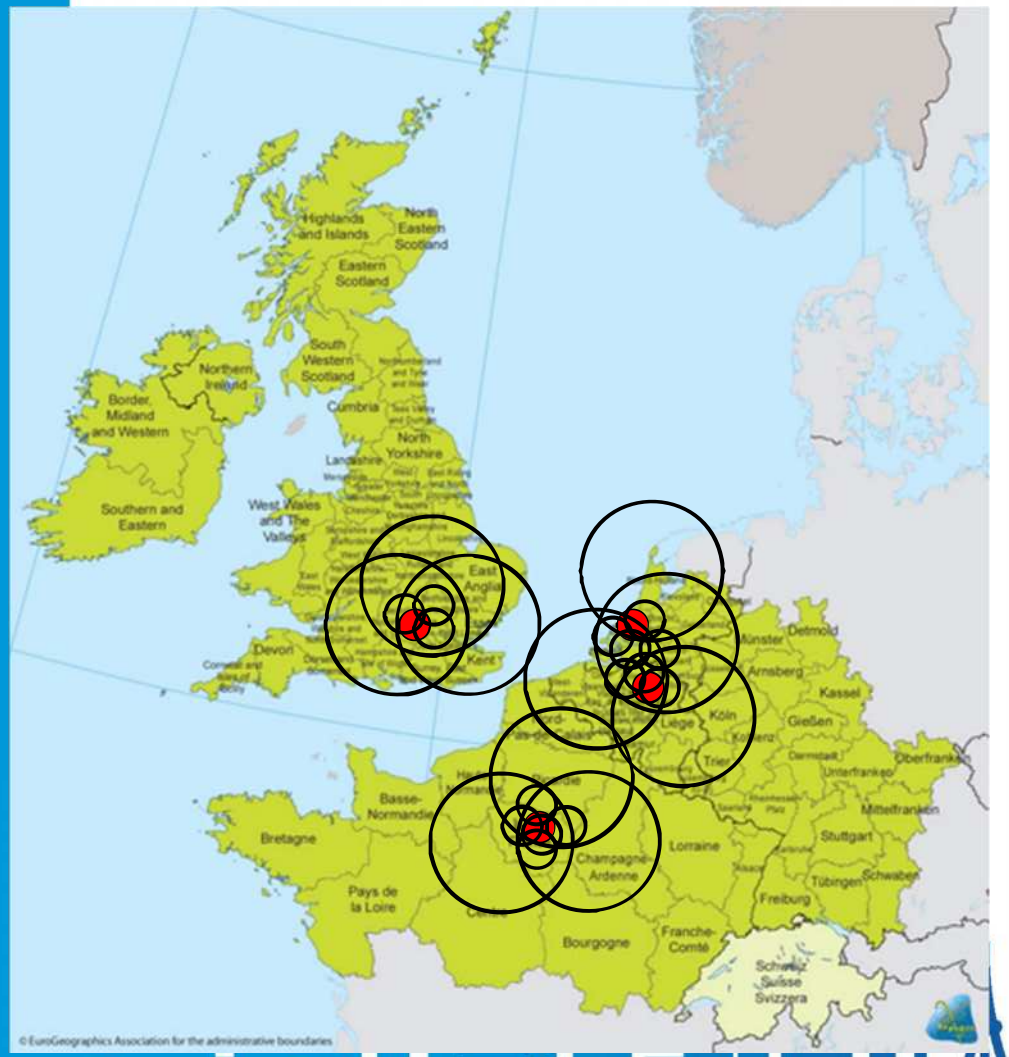


Geen polarimetrie

Optimaal gebruik van polarimetrie

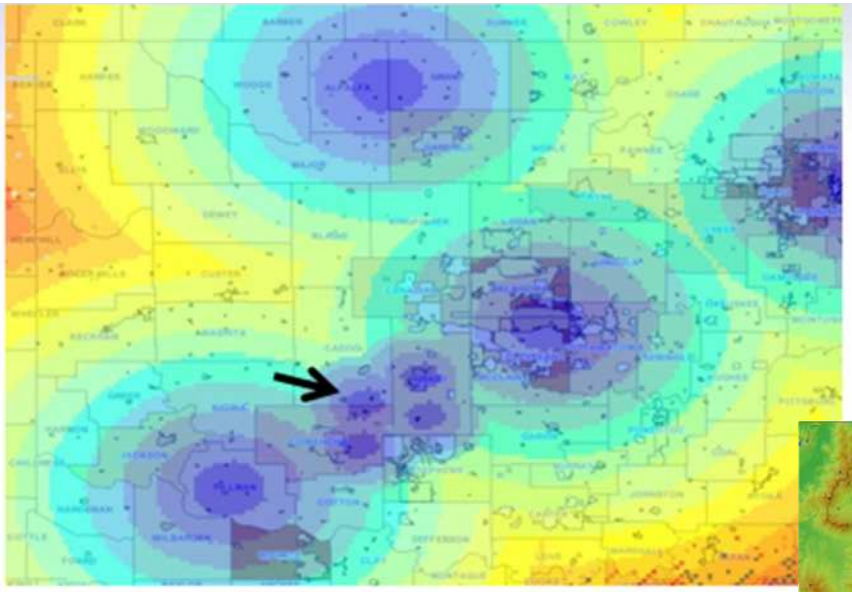
Courtesy Leijnse

Toekomst neerslag informatie stedelijk gebieden in Europa



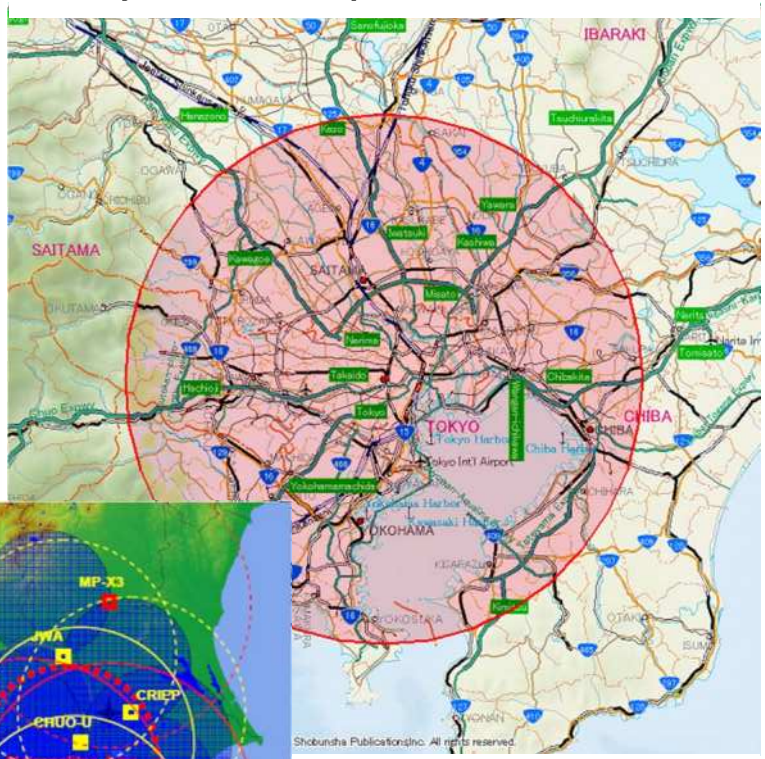
Voorbeeld VS: CASA X-band network underneath NEXRAD

Oklahoma; moving to Dallas Fort Worth in 2012



Courtesy McLaughlin

Voorbeeld Japan: X-NET, Tokyo Metropolitan area

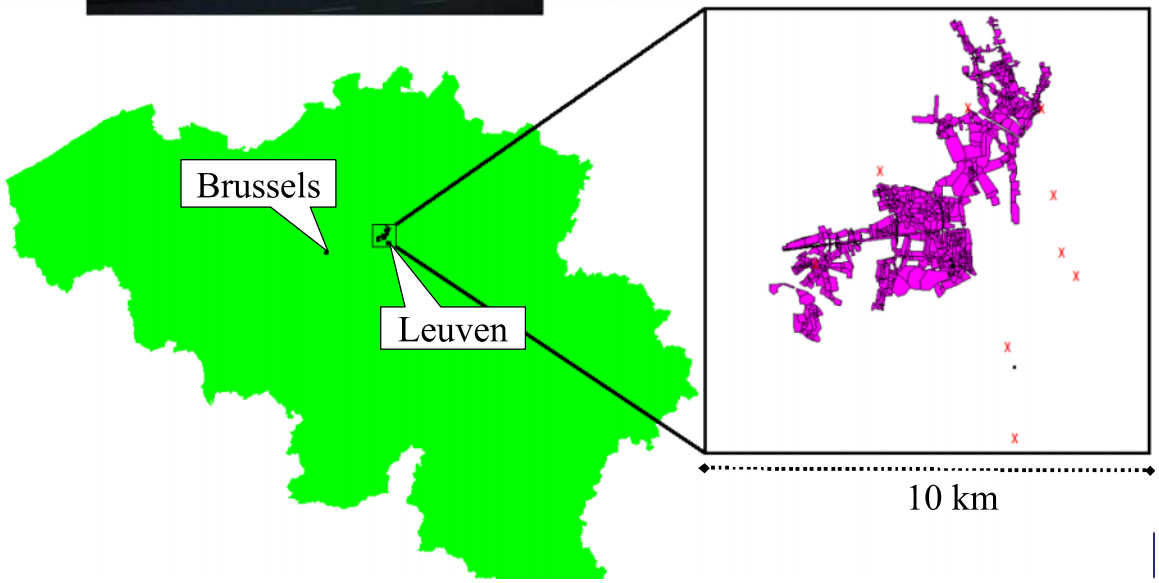


Courtesy Maki et al.

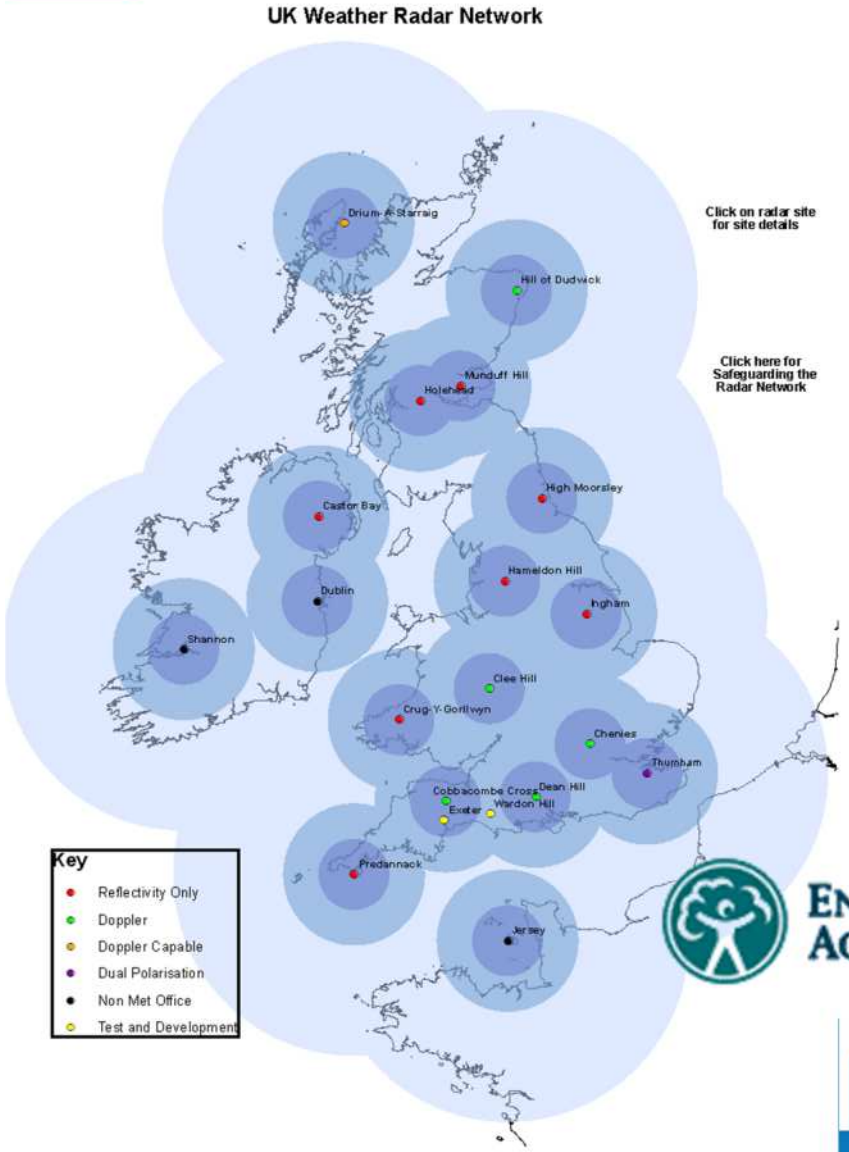
Leuven radar

Aquafin &
K.U.Leuven

X-band radar installed
- ✓ since 2008
- ✓ City LAWR (DHI)
- ✓ Experience with calibration



UK Weather Radar Network



- Location of radars
- 5km resolution coverage
- 2km resolution coverage
- 1km resolution coverage

- A diverse range of stakeholders and users

ENVIRONMENT AGENCY

Met Office

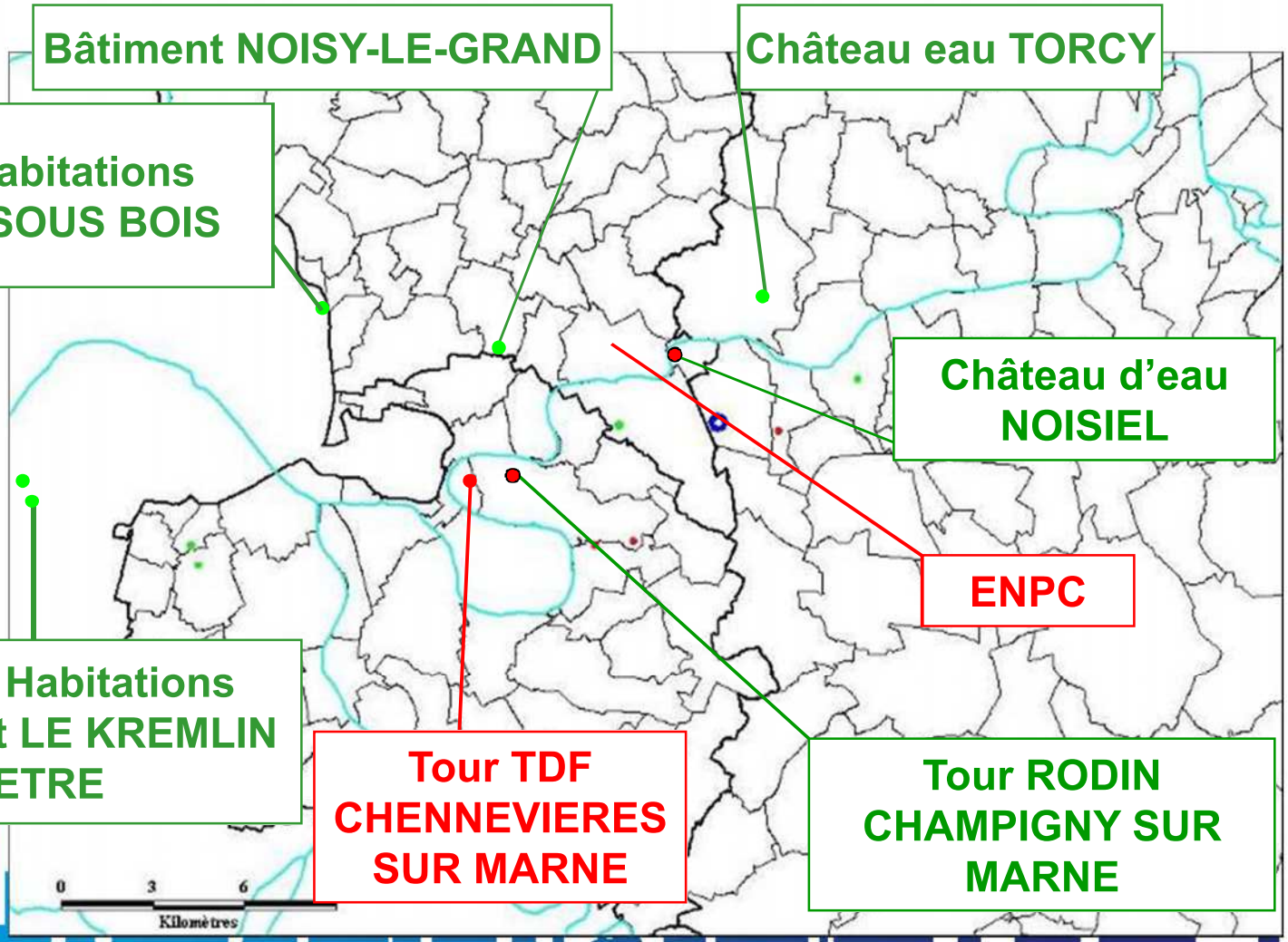
NORTHUMBRIAN WATER GROUP

anglianwater

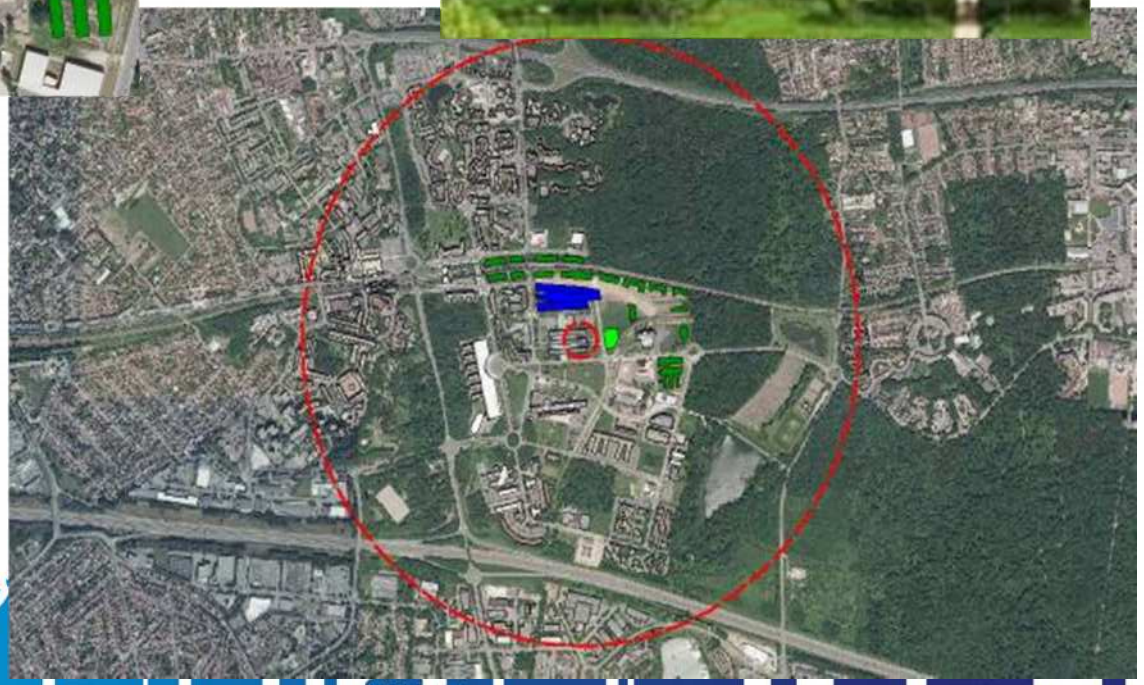
ROYAL NAVY

ScottishPower gas and electricity

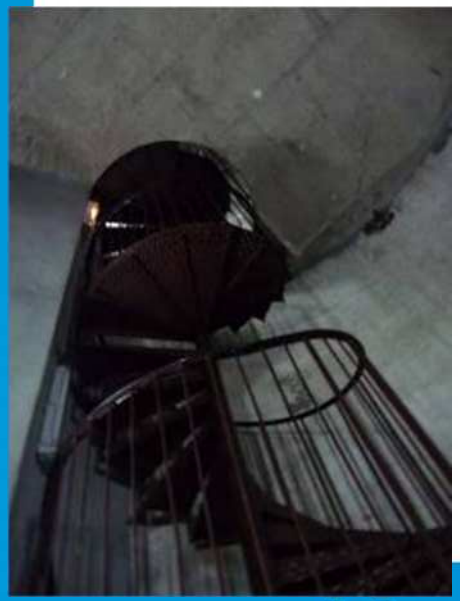
Paris
search for radar site



ENPC ParisTech campus

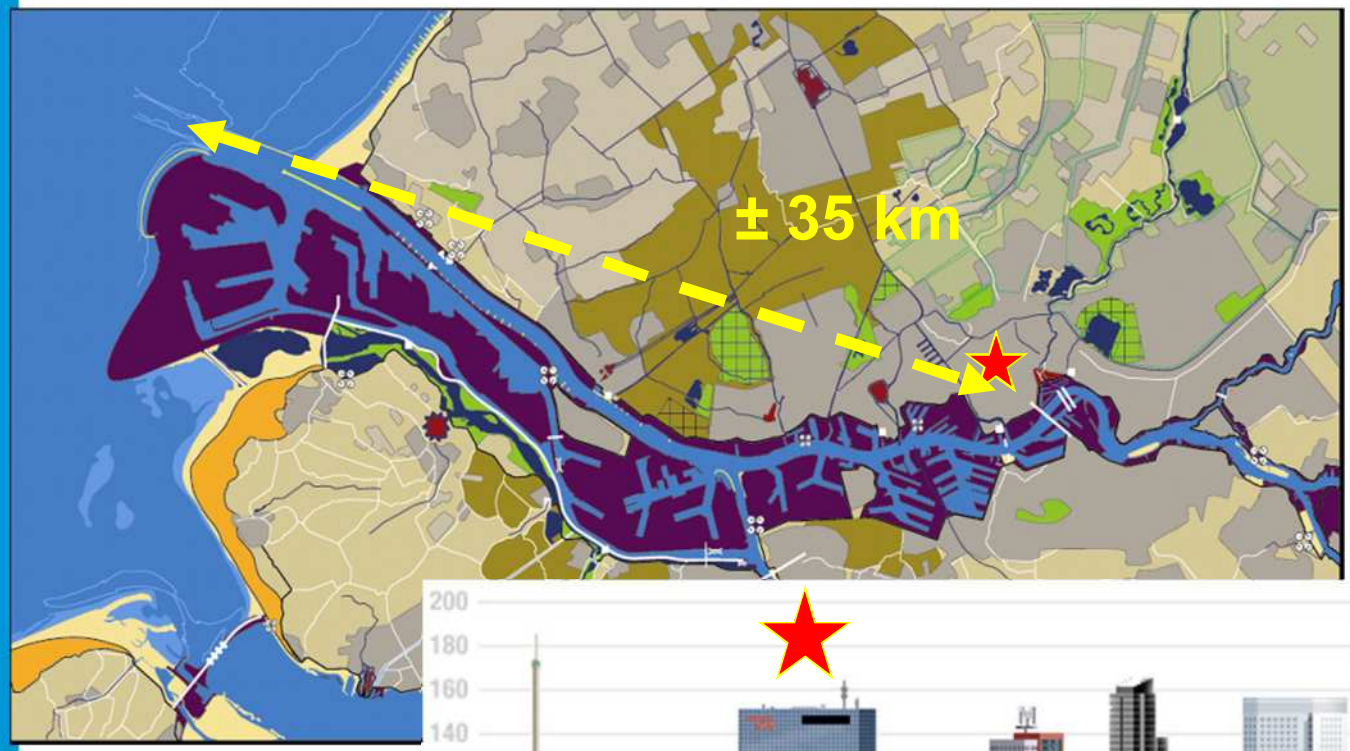


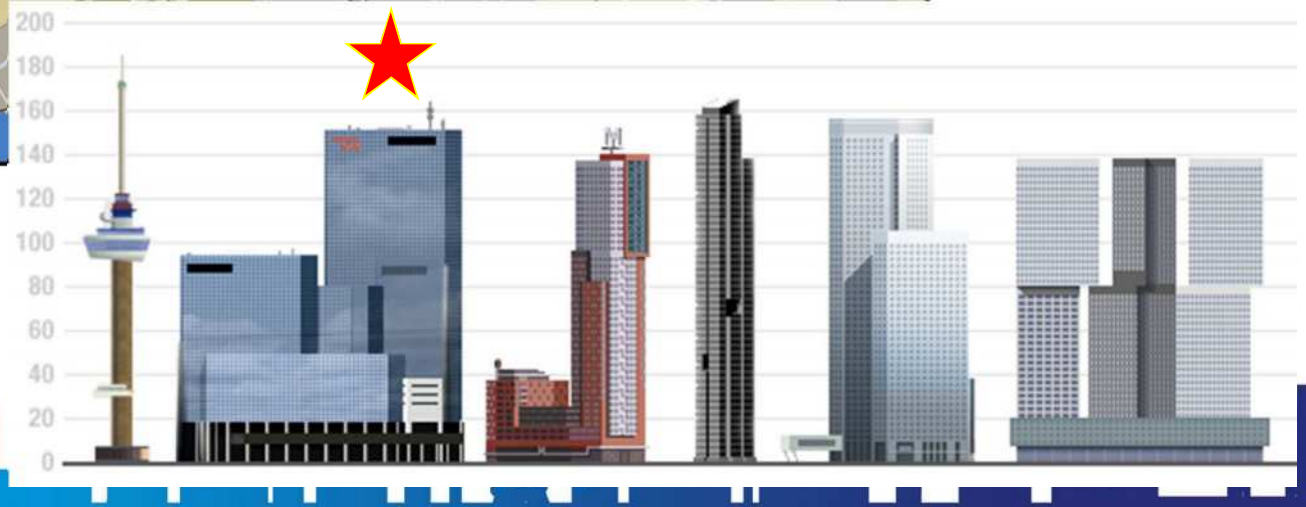
Paris - Tour EDF



Rotterdam

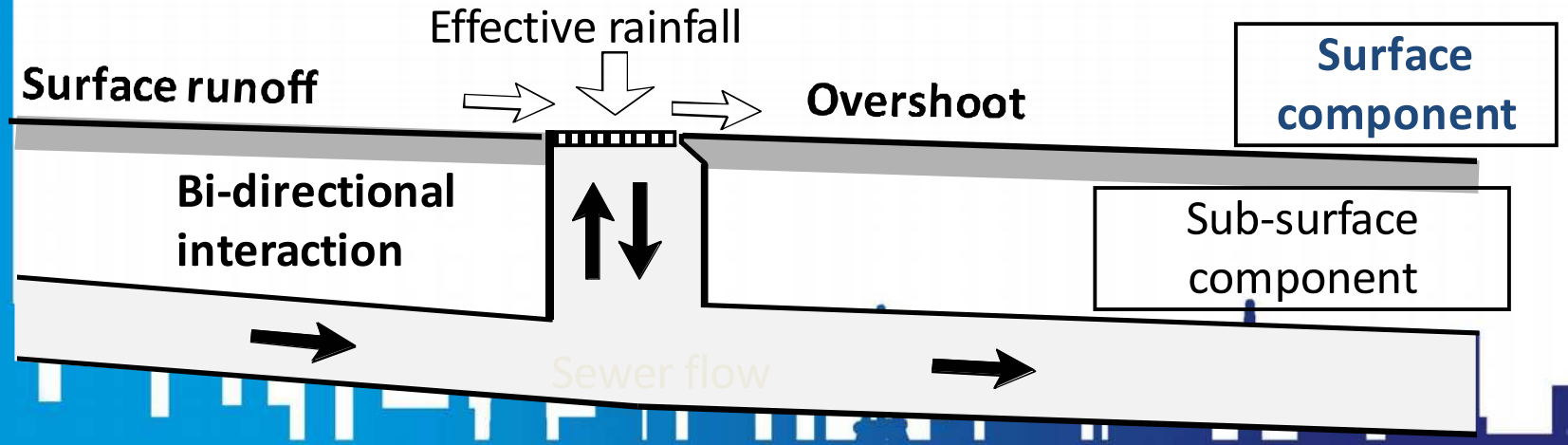
RainGain pilot site radar Rotterdam





Modellering van stedelijke wateroverlast

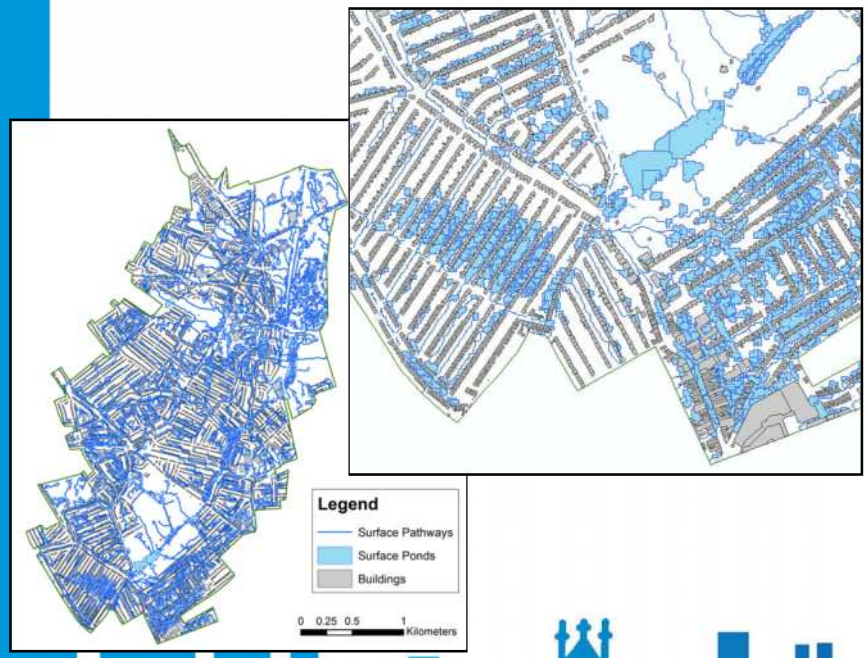
Dual Drainage Concept



Dual-drainage concept:
overland network + sewer network

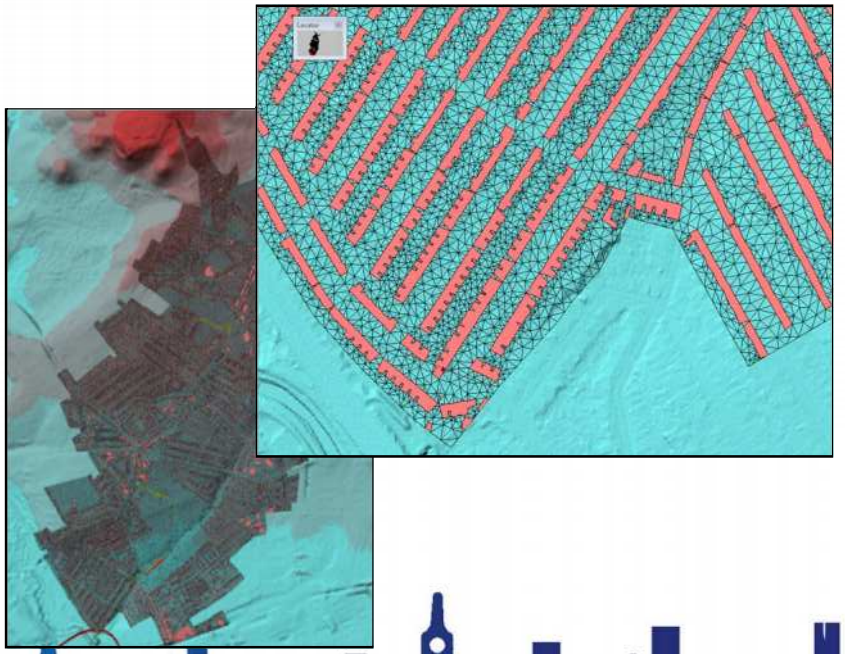
1D overland flow modelling

Nodes (ponds) and links (flow paths)



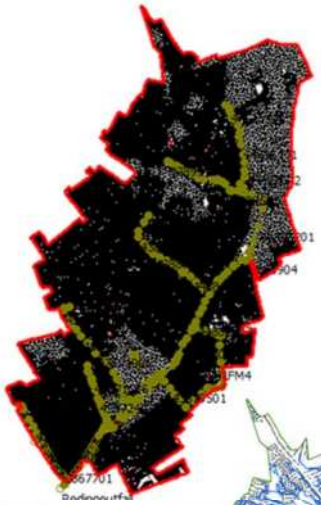
2D overland flow modelling

Surface divided into small elements
(squares or irregular triangles)

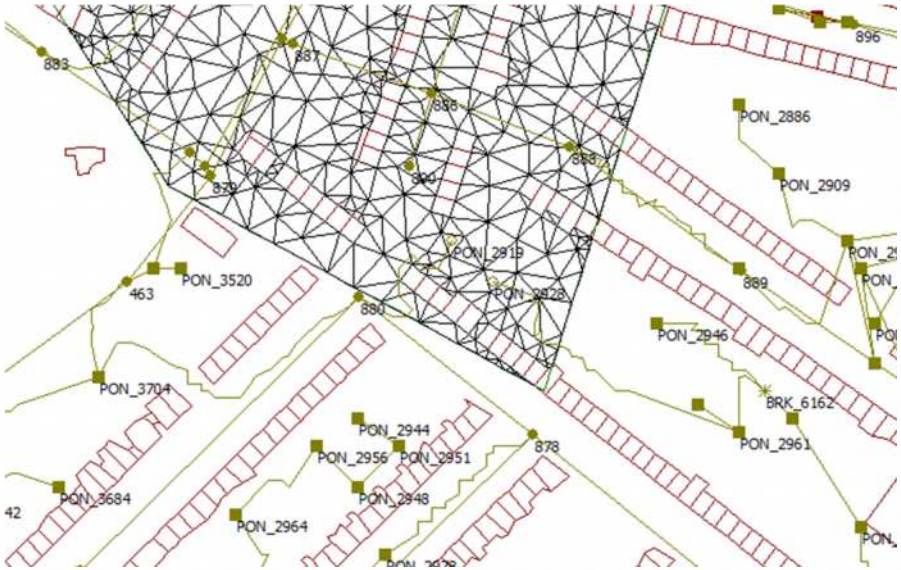


To combine their advantages and overcome their disadvantages…

1D / 2D



1D / 1D



Hybrid
1D/1D + 1D/2D simulation
In Netherlands: 3Di?

Aanpak van stedelijke wateroverlast

- Betere analyse lokale wateroverlast problemen (! Lokale neerslaginfo)
- Efficiënter investeren maatregelen tegen wateroverlast
- Optimaliseren inzet waterberging
- Wateroverlast-waarschuwing (uur vooruit)
- Wateroverlast-detectie (tunnels)

RainGain
National Observer Groups

Vier National Observer Groups: NL, BE, FR, UK

20 – 50 deelnemers:

- Specialisten: e.g. meteorologen, hydrologen, modelleurs,…
- Beheerders/planners: waterschappen, rioolbeheerders, strategische planners, verkeers- en RO-planners, …
- Uitwisselen informatie en ideeën over RainGain project
- Informatie/training ontwikkelde modellen en voorspellingsinstrumenten

Bijeenkomsten: 4x in project periode (1x/jaar)

RainGain Projectplanning

Start date: 1 September 2011
End date: 31 July 2015

Pre-Kickoff: 29-30 Aug 2011

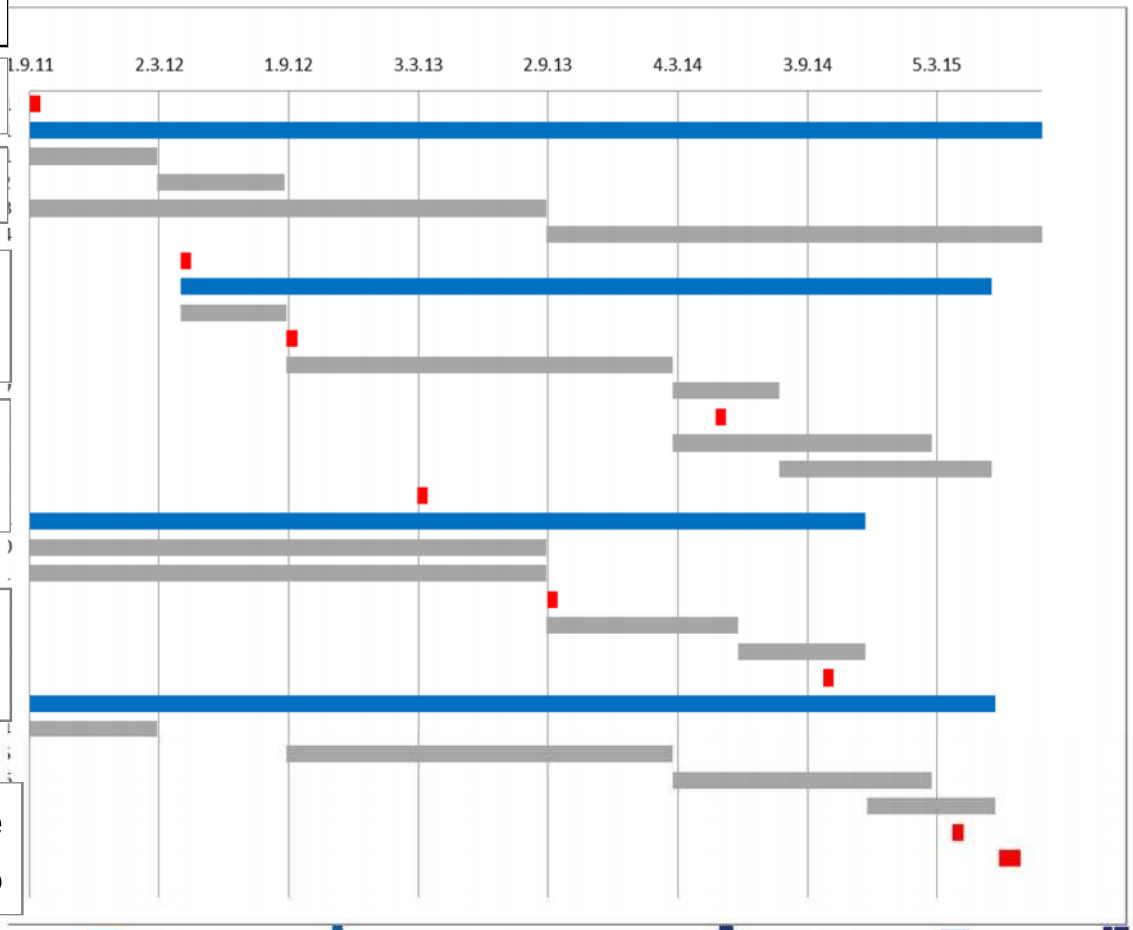
Official Kickoff: 17-18 Nov 2011

Workshops for WPs
(WP2 workshop April, Leuven)

Project consortium meetings
(September 2012: Rotterdam)

Nat. Observer Group meetings:
4 per pilot/country

International conference: June 2015



RainGain: meet the team