WP4

Implementation of fine-scale rainfall data, flood modelling and prediction into urban water management practice

Rain Gain

Fine-scale rainfall measurement and prediction to enhance urban pluvial flood management

Investing in Opportunities

Pilot location: Jouy-en-J

Rainfall

Rain gauges:

- 6 tipping bucket rain gauges with a 0.2 mm over the 110 km² SIAVB catchment.

Radars:

- C-band radar: the operational C-band wea France covers the whole catchment. The c and Doppler is located in Trappes at app resolution is 1 km in space and 5 min in time
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Urban plu

Past flood problems

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28th December 2003: N of flooding on Koningin Er the Southern part of the c in basements and houses intense rain. Approximate households and commerc were affected.

The spatial data, which is used for the Jouy-en-Jos French National Institute of Geography:
- Land use cover: the spatial resolution is of 50 cm x
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Figure 12: Illustration of th

Fine-scale rainfall measurement and prediction to enhance urban pluvial flood management

Pilot location: Sucy-en-Brie Catchment, Paris area (France)

Location and Environmental Setting

Sucy-en-Brie is a city located in the South-East of Paris, in the Val-de-Marne County. The catchment is a 269 ha urban area, with a average coefficient of runoff of approximately 35%. The sewer system is a separate one and storm water is routed to th Marne River, that is one of the main rivers of the Paris Region. The General Council of Val-de-Marne manages and controls the ma sewer system and has the charge of protecting people and facilities against flooding, as well as of protecting the natural environment fro pollution sources. According to the topography, three areas can be identified in the Sucy-en-Brie catchment: a plateau in the upstrea with an elevation of approximately 100 m, an alluvial plain in the downstream near the Marne river with an elevation of 32 m a between them there is a hillside with a steep slope. The plateau and the hillside are housing areas (collective at 10% and individual 90%) surrounded by green spaces, the plain is occupied by an industrial area and some sports fields.

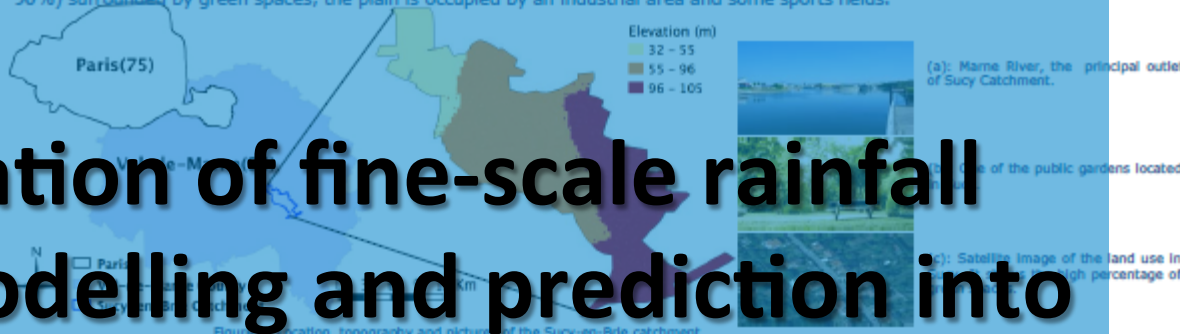


Figure location, topography and pictures of the Sucy-en-Brie catchment.

Urban pluvial flood risk problems and management objectives

Flooding history

Sucy-en-Brie catchment has suffered from several flooding events in the past as a consequence of:

1) The very steep slope in the hillside (≈34m/km) that increases water speed and causes overflows in the downstream pluvial network. Hence the plain (the area near the train station) is historically known as a flood zone.
2) The increase of imperviousness areas, however limited in this catchment.

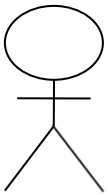
The last major event occurred on the 7th of July 2000, the stu area was flooded because of a rain event, during which a nea gauge recorded 84 mm of rainfall. Some houses and streets w flooded; the Sucy train station was also flooded and it remain closed for few days. This affected a significant portion of t population especially the commuters who had to use other mea of transportation to reach Paris.

Current Solution:

After the flooding of the 7th of July 2000, the General Council of Val-de-Marne decided to build a retention basin near the Sucy train station. This basin has two compartments that carry out two functions: (1) the protection against flooding by storing water during the peak flow events and (2) the depollution (through settling) of water before it is released into the natural environment.

The basin is operated with the objective of increasing the amount of treated water by using both compartments and of having the basin empty in case of a flood risk. Since these two

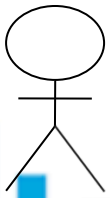
Extreme Rainfall in the City
diverging information needs



- Predictions (hour-days forecast)
  - how much rain will fall on this shopping street, square, vital crossroads?

- Real-time (nowcast)
  - where are floodings and which are critical?

- Analysis (hindcast)
  - How did models perform/hydrological system react?



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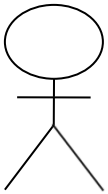

Issue warnings,
Operational control of weirs/pumps
Planning of emergency services

- Predictions (hour-days forecast)
  - how much rain will fall on this shopping street, square, vital crossroads?

Assess severity,
Focus emergency efforts,
Operational control

- Real-time (nowcast)
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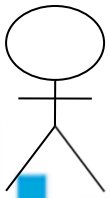

What can be improved,
Who is to blame for claims

RainGain- WPs and Actions

WP4 Action 14 State-of-the-art pilots for stormwater and flood control

- Factsheets: General setting and Technical details

WP4 Action 15 Overview of peak rainfall and flood events at pilots

- Factsheets: historical flood events, flood management objectives

Fine-scale rainfall measurement and prediction to enhance urban pluvial flood management

Investing in Opportunities

The district Centrum i
Rotterdam City, locate
Figure 1). The sewer
boundary of the distric
the central station, nex
installed. It includes
approximately 30,000
located in the Southe
Park" (24 ha) and "N
border of the district i
meanders (*see Figure 1*

Figure 2: Map of the Centrum catchment

Urban plu

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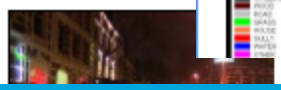

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Figure 8: Position of the rain gauges operated by the SIAVB (the studied catchment is circled)

S

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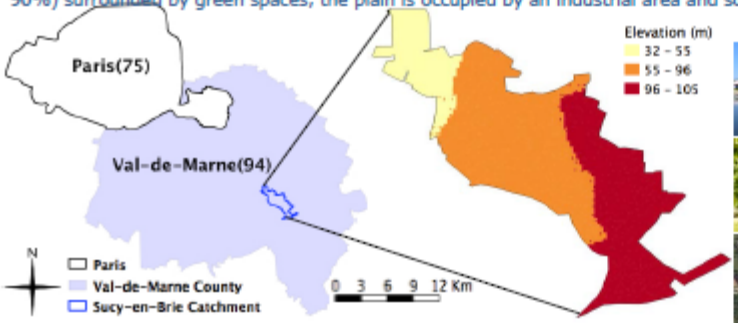

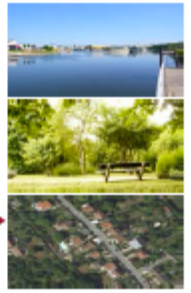

(a): Marne River, the principal outle of Sucy Catchment.

(b): One of the public gardens located in Sucy.

(c): Satellite image of the land use in Sucy. It shows the high percentage of green spaces.

Figure 1: Location, topography and pictures of the Sucy-en-Brie catchment.

Urban pluvial flood risk problems and management objectives

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RainGain- WPs and Actions

WP4 Action 16 Development of solutions to improve flood control

- Starting, based on availability of fine-scale rainfall data, flood models, rainfall forecasts

WP4 Action 17 Training on implementation of fine-scale rainfall data and flood forecasting

- Workshop April 2015, Rotterdam

RainGain: 4 cities, 10 pilot sites

- Cranbrook (London Borough of Redbridge)
- Purley (London Borough of Croydon)
- Torquay City Centre (Torbay, Devon)
- Leuven (Noord/gehele stad)
- Gent (PLURisk)
- Moree-Sausset (Paris Seine-St.-Denis)
- Jouy-en-Josas (Paris Seine-St.-Denis)
- Sucy-enBrie (Paris Hauts de Seine)
- Kralingen-Crooswijk (Rotterdam)
- Centrum (Rotterdam)
- Spaanse Polder (Rotterdam)